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CIRCLE OF LIFE.

TAKEN FROM A SCULPTURE IN THE CIELING OF A HINDOO TEMPLE
AT WUZZEREBAI:—HOT SPRINGS, TANNA.—BOMBAY.

By H. P. Malet.

CIRCLE OF LIGHT,

OR

DHAWALEGERI.

BY

H. P. MALE



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CIRCLE OF LIGHT,

OR

DHAWALEGERI.

CHAPTER I

"The Beginning."

It matters not to those who read whether I head my sketch with Dhawalegeri or Gaur-Sanker. The latter, which means source of light, has been changed by modern geographers into Mount Everest. They are both lofty mountains in the

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same region of the world, and either of them are good foundations for further superstructures.

My title means several things—Dhawul is a temple, Dewalle is a festival, Devi is a Divinity, Walla is a fellow, Gheira is a circle, Ghur is a hill, fort, or house; many other interpretations might be given to it. Those who please may call it the Circle of Light; or it may be called God's Hill. I do not use it thinking that I am entitled to do so, either by the depth or height of my subject, but simply because I require a measure of comparison to refer to. On no other pretence could I aspire to write of one of the highest mountains in the world—one of the first evidences that the chaotic masses of waters were gathering into one place, and that dry land was appearing; one of the first that stood up triumphant over the muddy waters, and testified to the fact of firmness and solidity. Proudly Dhawalegeri raised its head, as a proof that earth was growing distinct from water, assuming its place in creation, and offering its drying and consolidating masses

as one of the first strong bulwarks against the troubled waves. On the top of this mount shone one of the first sunbeams that sent its glance of warmth and love upon earth. Here some of the first-born atoms of existence were ushered into this world; here first fell the sweetness of the morning dew; from hence was absorbed the early moisture from the grateful earth; here first sprung up the children of her loving bosom—the grass, the herb, and the tree—and here their seeds grew again upon the virgin soil around them; all along the new-found shores the water vegetations discovered quiet nooks to grow in, the little lives of the deep found a place to cling to, and ere long the great fishes sported on its sandy banks. Here midst the tangled bush the first birds chirruped out their joyous songs; in its sheltered vales, on its sunny slopes, the happy cattle pastured in freedom; amidst the rocky clefts and fissures the unmolested reptiles glided at their leisure, and the beasts of prey found food in plenty round its teeming brow.

Did man first inhale the breath of Heaven amidst the rugged lands that form the outworks to this mighty bulwark of the earth? Was his only commandment here broken, and his first knowledge of good and evil gained in this early Paradise? Was it from hence that he was driven out by the chastening hand of his Creator from the burning gardens he had vainly thought his own? Did his thoughts turn to a knowledge of his God as the golden sunbeams glittered on the high up summit of the mount, long before they shone more feebly on his degraded home, or did he wander up and down upon earth, careless of all, save his life, for to-day and to-morrow?

I will leave, to those who please, the answers to these questions. For myself, I am contented to believe that all was created, and that ever since that creation all upon this earth and in the Heavens above it, has been guided by one firm hand, and watched over by an eye that has for ever foreseen the results of God's labours.

Let us go back to those dark days when this

globe was void, when thick dark waters rolled continually, and their liquid currents ran smoothly over the vacant womb of time. Nothing to be looked on by that ever watchful eye, but a dark watery waste, a revolving sphere, chaotic, occupying a space in the regions beneath His sway.

This was the Earth, when the spirit of God moved upon the face of the waters. The glorious results of this visit are before us in the beautiful world we live in, and we exercise the dominion over it which was given to us by the Creator; over the fish of the sea, the fowl of the air, over the cattle, and over every living thing that moveth upon the Earth. To exercise that dominion aright we were endowed with reason, a sublime gift, which used properly, would place man on a near equality with his Maker, and fit him to conduct the duties of his stewardship in a manner, only inferior to the God that entrusted them to him. Many men have applied this gift to the correct understanding of the order of creation, so that, by knowing the origin of things

in detail, they might be more fitted to take a just and comprehensive view of the whole; for as no one is capable of managing a machine of human manufacture, unless he is acquainted with its mechanism, how could one hope to exercise his dominion over God's creations rightly, unless he endeavoured to comprehend the intricacies of their wondrous systems?

Under the influence of such thoughts, I have been tempted to look back upon nature, such as has been submitted to my view for half a century, and to consider, with my own, the ideas which others have given to the world. In these there is much that I cannot consent to; in nature there is much that I cannot comprehend, and possibly, much that my vanity leads me to think I do, while I do not understand it. In attempting to describe what I think I see, I may use the thoughts or expressions of others without knowing it, and therefore without acknowledgment; I can only say that nature is open to all, and I will not knowingly neglect my duty to my

neighbour ; but as the general ideas are my own, such acknowledgment will be chiefly in reference to those interpretations of creation which I find myself unable to consent to.

Under these feelings, I enter upon the wondrous subject of creation, not with any idea that I can in any way, fully or satisfactorily, explain that event, but with the purpose of giving an ordinary sketch of the process as I understand it, a sketch which contains I trust no principle of evil in it, but which is in accordance with the enigmatical language of our Bible, the words of which, appearing plain and simple, contain matter which man cannot comprehend. I will refer to the first verse of Genesis to explain my meaning : "In the beginning." When was it? "God created." So then God was before the beginning. If we ask for how long? we reply at once there was no beginning for God. The beginning then does not refer to Him, but only to earth and heaven, such portion of heaven only as has connexion with earth.

There is no reason why the heavens, the everlasting blue, with the little twinkling stars, and distant worlds, should not have had a beginning; if there was a beginning to this earth, there was one to them; no one can tell which was first, or which last. I dreamed once that man lived in each celestial orb; not supreme as he is here, but submitting in each to such other organism of our creation as in its turn became paramount. It was a metempsychosian dream, the interpretation of which was to do to all animals as I should wish them to do to me.

Heaven and earth were then created, and that was the beginning for them; but the Creator had no beginning, His rule was over all uncreated from an endless, an *incomprehensible* period, beyond time, space, and thought. He is here now, and will be for ever, and ever; creating, ruling, and guiding the everlasting circle, revolving in one grand scheme of eternal rule, in which every atom of creation, as each figure in my frontispiece, treads upon the heels of its predecessor, without

confusion and without being perceived ; such is life, so it has been, and so it will be for ever and ever.

With this introduction, I launch at once upon the deep, where it will gradually appear that there are two words, which frequently used in the Bible history of the early world, I do not use in their literal meaning.

One word is "*Day*," which is now generally allowed to mean a period of unknown time.

The other word is "*Earth*," which appears to be used as signifying the whole, or only a known portion of it.

CHAPTER II.

"And the Spirit of God moved upon the face of the waters."

THE notes to my Bible tell me, that previously to the visit thus announced, there was no wind, but that the Holy Ghost, in His Almighty influence, "moved, or sat brooding upon the mingled mass."

Without stopping to argue on the wind, or to puzzle myself with thinking how the Earth revolved without it, or whether it revolved at all; I will at once say, that I cannot accept this interpretation of the event recorded—an event entrusted to Moses in enigmatical words, which embraced a great deal more than at first hearing they seem to do.

The spirit of God seems only to have become known to this world in stirring times, for though He is here always, yet it is on these occasions only, that His presence is unavoidably felt and acknowledged; such as the dismissal from Paradise; when the smoke from Abel's sacrifice arose to Heaven; when the flood destroyed all life upon earth; when the Tower of Babel fell; when the Israelites walked through the Red Sea. There was no brooding in our acceptation of the word on these occasions, and I believe there was no brooding when His spirit moved upon the face of the waters. Calms may rest upon the deep, the wave may become still, and the water may become decomposed, and rotten from very quietness, but this was not the state of things in the Creation; all was energy and activity; there was a great work to be done, and the waters had to do it.

"*Moved*" is a better, and a more expressive word to signify the visit, which was handed down in holy lore, as the great event of this

world; a visit of sublimity and love, which moved the dark dull seas to adoration, as they in their vastness obeyed His will.

Out came the breath from His mouth, up sprang the wave awake from its torpor, the thick spray darkly glistened on the heavy foam, as it sprung up in the incipient birth of light; onwards flowed the heaving currents, thick with matter. All around the sphere, current met current, and eddies vast were formed, and mighty whirls appeared "*of the endless and measureless world of the deep.*" They came and they continued, whirling and eddying till their local labour was completed, till the currents no longer contended, till there was no more cavity to fill up. They had gathered the passing matter from the tides, the waves, and the ocean currents; every thing borne upon the surging billow had been gathered by their careful hands, and the never-weary waves flowed on with their burdens, till some new places were found that wanted them.

Slowly and grandly flowed the unobstructed

tides on their circling journey, as they felt the influence of His presence, and as they continually heaved along, they bore upon their silent streams the refuse they gathered from the sandy deep; strongly flowed along the more eager currents anxious to fulfil His wish, and the never-resting billow rose in its ripple, or broke in its fury, as it met with the breath of His mouth.

How had this breath been working since it first moved upon the waters? It had stirred up the liquid, it had gathered on its active wings water and matter; did this matter help to make the hazy darkness turn to light? did the silicious foam, that it swept from off the deep, help to form that canopy, through which the coming events were cast before them, till light became distinguishable from darkness, and the worlds rejoiced in the discovery of a new found gem, as a Discoverer might rejoice in a new found land?

That wide sea upon which the Lord had moved, with its restless waves, its perpetual tides, with the everlasting currents of water and of air, had

been, since the visit began, the nursery of Creation, with a never ceasing action through uncounted time; in perseverance, and in harmony, they had laboured hard, they had collected on their never-weary shoulders the materials from chaos; with wondrous art and care they gathered the atoms together, and separated those that did not, from those that did adhere; for long ages the currents flowed along thus laden, for long ages the tides quietly bore their burdens; and associated with these, as inseparable companions, the eddies and the whirls performed their portion of the duty, and with their wondrous combinations formed in time the bulwarks of the Earth, our great, our wondrous mountains.

Yet ere they rose from out their rocking cradle, from out that nursery from which so much was coming, a pathway had to be cleared for them, and to be lighted up; the event was worthy of a grand illumination, but God's ways were not as our ways; there was something to come, which might be lost in the all pervading darkness; the

breath of His mouth had already laboured hard to collect the materials for the next endowment ; other matters were awakening, besides the water, and matter had been gathered in the vapoury moisture, which was ready to work a change upon its nature—ready to act obedient to His word.

CHAPTER III.

“ And God said, let there be light, and there was light.”

WITH the harmony which could only follow infinite skill and God-like arrangements, another result follows on the heels of the movement described in the last chapter. The breath of His mouth was performing other functions. Darkness and His presence were incompatible. There was a lighting up in his very breath ; and while it hurried on the buildings below the surface, it drove away the haze from above, and gathered up the vapours from the deep for His special service.

Even as the waters heaped the heavy and the light particles of materials down below, even so

the winds gathered matter to form the wondrous canopy above. In this canopy the vapoury matter hung thickly, permitting only a gentle light to fall upon the coming birth below. There was no hurry, no confusion. The vapours could not be extricated from chaos all at once, neither could they have been used in greater abundance than they were. The demand was only equal to the supply. The deepest, the most careful consideration ruled the whole.

The waters began to sparkle and laugh at the work they were performing, and the merry winds blew round and round obedient to His word.

Higher and higher arose the canopy of matter, till there was a division between the light and the darkness. Our globe revolved as it does to-day, the light was called day, and the darkness night.

Let us for a moment look back upon what had been, upon the blank from which this globe was rising. Imagination can scarcely grasp a world

in darkness, so dark that the human eye, if it had been there, could have dwelt on no object; so dark that no object could have been depicted on the retina of an eye; when there were no forms, no shadows, no reflection, refraction, or diffraction; when chlorine and hydrogen gases had not combined, but hovered separate and distinct in the darkness around, or when the water had not decomposed sufficiently to liberate its hydrogen, and when the chlorine gases were still absorbed in the all-prevailing deep; when there was no vapour for vegetation to flourish in, and no herb to consume the vapours; when chlorine gas and oxide of carbon had not united beneath the genial light, and when, in consequence, there was no colour—all dark, dismal, and chaotic.

This chlorine appears to play an important part; even now it is used for decolouring by the bleachers. By itself it is harmless, but when mixed with water, it destroys entirely all colour of vegetable or animal matter; but even in this agency, it is dependent upon the hydrogen which

may decompose from the water, whilst its oxygen performs the bleaching duty.

My paper is merely a sketch, but the properties of these gases seem to be so completely interwoven with light and darkness, with colour and no colour, with the gradual expansion of light and reduction of darkness, that I attach the greatest importance to the subject, but leave it to those of deeper thought to follow up the intricacies of the questions which arise from it, and to determine how far the light of heaven is dependent upon the gases or the vapours of the earth, and I ask them to think whether the very dust which is blown up from the earth's surface is not connected with the heat and cold we experience, with the display of meteors which we witness, and with the sunbeams which shine upon our earth. In the last two years (1867, 1866) there have been great meteoric displays, and this season of 1868 has been an extraordinarily warm one. Here, in the dust and vapours of the earth, is the clue for close reasoners and acute astro-

nomers to follow up the wondrous principles of light and heat.

The division of the waters was then completed, our glorious canopy grew lighter and lighter, gradually lifting from the waters, a self-sustaining floating matter, liable to winds, and changes, cold in one place, warm in another, shifting here, and calmly resting there, till all was growing light and lustrous. And God said, *"Let there be a firmament in the midst of the waters, and let it divide the waters from the waters."* So He *"bound up the waters in His thick clouds; and the cloud is not rent under them."*

Thus, step by step, this world was working on; He moved upon the waters, and ruled all with the breath of His mouth. All around this globe the action was even, and uniform, there was nothing unshapely in the firmament, there was nothing unequal upon earth, all was adjusted beneath the curbed deep, with an ever even measurement; while above, the canopy of air, thin, transparent, yielding, and powerful, flowing

in equal streams all round the rising earth, gathering the cold from the Poles, and warming them from its bosom, raising the waves in its haste, or smoothing them in its calmness, was gradually getting luminous, and preparing the Heaven for the great event which was to follow this, the second day of creation.

CHAPTER IV.

“ And God said, let the waters under the Heaven be gathered together unto one place, and let the dry land appear.”

No sooner was the Heaven formed than a further step was found to follow on ; the waters above were collected into their respective places, and those below were constrained to imprisonment ; their impetuous force had flowed around the globe ; their duty was so far done, that they themselves, while rolling on in their joyous liberty, had fabricated the prison walls, which were to confine the unwilling prisoner, a prisoner that ever since its capture, millions of years since, has never omitted to use every opportunity of escape,

but the orders of the Creator have been obeyed,
—“*Hitherto shalt thou come, but no further.*”

Up rose the dry land, and the waters were gathered together, so sea and earth came forth distinct and separate to witness the grandeur of their Maker.

Let us cast a look at the present configuration of the earth, and the present action of the sea, with careful eyes and anxious heart to discover, what traces are left of the creation of the second day, of which “*God saw that it was good.*”

Far away in central Asia are the now snow-capped summits of the mountains, which first grew out from the sea, here peeped out those massive mounds, which first saw the light of day and offered their hearts as a bulwark against the beating wave. Here the waves first met with opposition, and flung their angry foam on high, to fall not again on the bosom it had left, but to carry in its foamy spray atoms to aid the growth of its prison walls. There was no refuse then to

wash away, the hardning rock had but just emerged from its birth-place, blue and bare, manufactured in darkness, with no vegetable, no animal life, no organic matter to aid its consistency, or to give it a covering, but all pressed together by a long and never intermitting weight of water ; it arose even as those rocks arise, which can be seen on the north and west of Ireland, or just emerging from the water in the Adriatic sea, bare rocks upon which the surging wave still breaks and rushes over.

Up rises Dhawalegeri, my circle of light, which is apparently of an unknown height. I have three measurements before me, 26,462, 26,862, and 28,072 feet high. It matters little which is correct, or if none of them are ; I will call it a mountain of five miles high.

In its vicinity are other mountains of similar or of greater height, and in starting from these regions of Central Asia, there are various mountain ranges, such as the Altai, the Arak, the

Mustag, the Himalayas, and the Hindoo Koosh. I take this region, then, as the first which arose from the water in this hemisphere.

There is a confused mass of mountains, similar to the confusion which we see amongst the clouds when the wind is on the change, when varied heights produce their distinct and separate masses of moisture, when one strata is thin and filmy, one is blown about into whirling tails, another into white straight lines, and the lowest evinces the agitation of the atmosphere, by running out into jutting capes and white-capped promontories ; there are whirls in the air to produce this appearance, and there were whirls in the water to produce these mounds. Let us endeavour to consider what produced these whirls.

The winds of the present day prevail from the south west for one season, from the north east for another in these regions ; now supposing that these were the normal conditions, that these currents have been alternately blowing for ever, that these winds affected the currents of the then

waters, as they do of the present, we have their meetings in the region of the mountains now rising. These meetings of currents were not like the little meetings of present days ; there was a wide uninterrupted space for the breath to blow over, and a wide expanse of water for the currents to flow over. Here was a meeting place, and here that meeting produced the natural results in eddies, and in whirls.

“Let the dry land appear,” implies that there was land, but that it was all watery, all mixed up in apparent confusion in the chaos of waters ; the eddies and the whirls seizing these mixtures of all matters in solution, gathered them into places, where the currents permitted them, on their confines, and within the circle of their embraces. Any one who likes to study the effects of whirls or eddies, can see the same operation performing at the present time in any moving water. Steadily, and zealously the waters worked, stirring up the material from the dark depths with one effort, and collecting them with

another ; through all time, before it was distinguished by light, through day and night, even till the Heaven was made, and then its first works were required at its hands.

Blue, hard, and strong the dry land appeared, offering its breast to oppose the waters, and to prove that it "*was good*." Let us watch the results of this new formed opposition ; the currents of water were turned aside, the streams from the south west could no longer pass the monstrous barrier they had heaped up, and the current from the north east could no longer meet them on the first disputed grounds ; but their dispute was not over, the south west current came up from the west over the present Persia, from the north east over the present Pegu, and meeting its adversary on other terms, and with divided strength, built up the continued range of the Himalaya Mountains on one side, and finished the great Hindoo Koosh on the other. The winds still blowing from their normal points, blew over these obstacles, and aided the water currents in forming the founda-

tions of the Stanovoi Mountains ending in Bherings Straits. (I may as well say here, that I do not insist upon winds and currents acting together ; it has been clearly explained by authors that they do not.) Strong currents coming down here from the north, built up the Mountains of Khamscatchka ; a troubled and uncertain sea raised the China Hills, and continued its work through Pegu, Siam, and the Eastern Archipelago.

What is now called the great Desert of Gobi, was at the time I allude to under water, which was forming the Highlands of Siberia, the steppes of Tartary, and of Khirgitz ; the north east currents turning westerly along these obstructions, built up the Ural, and formed the rough region of Orenboorg. Currents of water still ran up over the present Persia, and meeting those which flowed through the gaps from the north east, over Siberia, Tartary, and Gobi, formed the region of the present Beloochistan, to match the disturbed country of Burmah in the east. As if there was some relationship, or

correlation (as the Duke of Argyle expresses it), in the growth of lands, the south west currents now laid the foundation of the Syadra Mountains in Hindostan, as it laid those in the Malay Peninsula, running in the same direction, and of the same character.

While all this was doing, these currents were at work in the north west of Asia, with the great Caucasian range, and meeting streams, which ran over the site of the present Mediterranean, built up the foundations of the Syrian hills, and of Palestine, while the south west streams barred out of their former course, met them on other grounds, forming by their collision the Mountains of Arabia, and the high lands of Abyssinia.

The labour of creation was going on all over our sphere, and again the correlation of growth may be noticed. Asia had a centre, Europe had a similar one on a smaller scale in Switzerland, the Alps may correspond with the Mountains of Nepal, the Bohemian hills with the Stanovoi, the Hartz Mountains with the Altai, the hills of

Norway with the Ural, the Pyrenees with the Palestine, the Jura with Beloochistan, and the Appenines with the Syadra range of India. In both regions the centre evinces similar grand functions of wind and water, similar forces operating on the watery deposits, and heaping them up in mounds and banks, by the working of their eddies, and their whirls.

Continuing the formation of the skeleton of the earth, I will now cross Bherings straits. I have shewn how foundations were laid on the Asiatic side, by interrupted currents and shifting eddies; here, on the American side, other forces were at work, a steady current flowed from west to east for long continued ages, building up the foundations of the Rocky Mountains, and the Andes over 130 degrees of latitude. There was a disturbing cause in about 20 degrees north, but the line was resumed again on the equator, and carried on till it reached the present rugged regions of Cape Horn.

This regular current formed the back bone of

America ; its other mountains in Canada and the South were formed by the flow of waters coming in from the eastward, and the north, meeting stray currents which ran through the gaps of the great range.

Returning to the African regions, I find that the Algerian mountains were formed by currents from the north, while large seas flowed over the present desert of Sahara, to the south of which these seas, and others running counter from the south, fabricated the mountains stretching from Sierra Leone on the west coast, to Cape Guardafui on the east, including the Mountains of the Moon. In the south of this great continent I find another example of correlation, as the south west currents of wind blew over the obstructions in Nepal, and met the north east currents of water in the Khamscatchka region ; so the currents of north east wind blowing over Nepal, and the Indian ocean, built up the foundations of Madagascar, and the South African mountains.

Over these outlines, then, were laid the foundations of our present continents, and in scattered spots in the ocean the skeleton of our dry land was beginning to shew itself; vast materials were heaped together by the never resting wave ; with nice judgment and beautiful discrimination it separated, and parcelled out its burdens ; with wondrous art it compressed them together, and by long and patient labour it obeyed the order, " Let the dry land appear !"

CHAPTER V.

"And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit."

No sooner had the dry land appeared than it had a duty to perform; nothing could rest quiet under the moving cause. The Earth was called on to be a mother, and God saw that the tree, the herb, and the grass were good—much depended on these arrangements, and the Creator examining his work found it beautiful, useful, and very good.

Every rock that grew above the wave was clothed, and from that time forth each point as it grew upwards contributed its mite to the making of the land. Year by year, season by season,

through a long succession of ages, the grass withered away and grew again, the herb shed its seed, and that sprung up again, the tree gave its fruit, and shed its leaf, which grew again in the coming year.

There was the dead leaf, the refuse of the herb, the dried up grass from every plot, from steep rock, and from sheltered rock to be washed away ; the spray of the sea, the moisture which had not left the earth, and the never resting wind carried off surface refuse as they could ; and all this, gradually drifting downwards, settled in spots ready to receive it, or was carried on the bosom of the wave to places where it was wanted ; all nature combined in the great work, and it progressed, the third evening was come, and all was good.

Now the grass, and the herb, and the tree were each in their turn doing something more than simply growing year after year, and leaving their refuse on the ground ; there was another duty they had to perform—they had to draw in the vapour

from the air, to suck up the moisture from the ground; each acted to the best of its capacity, and aided the wind in its vast operations; between them both the air was cleared, and the Heavenly luminaries appeared to the smiling earth; the loving sun, the fickle moon, and the twinkling star, that had for so long a time given their feeble light through the haze, which enveloped the earth, now showed themselves in their lustre, and their warmth, and brought on the most wonderful results.

The waters brought forth life; the creature that only shewed its existence by a movement; the lowest grade of organic existence was, we may suppose, the first; then came the fowls to fly through the brightening firmament; then whales, with all kinds of fishes, and strange creatures after their kind, and all the varied race of water life. They all pleased their Creator; He found that they were good,—there was colour, and beauty, infinite variety of appearance, and occupation—so he blessed them, saying, “Be fruitful

and fill the waters in the seas, and let fowl multiply in the earth."

Then were busy days with the waters, upon which He moved, upon which He lavished His affection, and produced such wondrous, such charming forms; there was much for them to do; they continued their original duty, His breath continued to blow, matter increased for both to work upon, silently the dry land grew, there was space upon it, and that space was clothed with herbage; there were the coloured flowers upon it now, as there were coloured fishes in the sea, and the time had come for the rich herbage to do another duty.

Then was the mandate issued, "Let the earth bring forth the living creature," cattle, and creeping thing, and beast. The earth was occupied, the beast lived upon the creeping thing, and on the cattle, creeping things consumed other creeping things, or crawling insects, or destroyed by strength or more subtle means the beasts, and the cattle,—the latter pastured upon the herb,

and the grass, or browsed upon the foliage of the trees.

It was all good ! There was no error in Creation, everything was adapted to its place, every place was occupied. God held the dominion over all ; He controlled every creature he had made, He controlled the sea, the earth, and the air ; the breath of His mouth breathed in love over all the wide creation ; it was very beautiful ; there was vale and hill and water, woods of lofty trees, and foliage fair, herbage rich, and flowers lovely, the wild exuberance of a godlike birth. God looked upon its wildness, and its beauty, and created man, to take His own place upon the earth, to act as His vicegerent.

Male and female created He them, to be fruitful, to *replenish* the earth, and *subdue it*, to *have dominion over the fish, and the fowl, and every living thing* that moveth upon the earth.

Then he gave them for food the herb and the tree ; and to the fowl, and the beasts he gave every green herb for food. For six long ages of

our calculation, for six short days of His eternal time, had the Creator moved and laboured with his breath upon the waters; He had built up this globe, this earth, this sea, this Heaven, from whence His sun, and moon, and stars have shone from that time to this, and over all that they shine upon has God given to man the dominion.

CHAPTER VI.

"First follow nature, and your judgment frame
By her first standard, which is still the same."

THERE was a wide and a growing region before man ; a goodly garden was prepared for him, with that Godlike wisdom and forethought which could only come from the great Creator. The earth, which had risen from the waves, offered its fruits and herbs for man's use. Upon what did they grow?—

"What hand hath strewed these riches o'er
The giddy rock, the wilder moor ?
What makes each varied plant to grow ?
From whence do all these colours flow ?
Look all around, you cannot see
A useless herb, a fruitless tree."

My question opens up a wide field—a field for inquiry which man has perpetually endeavoured to fathom. The most acute reasonings, the deepest research, and the most unwearied energies have been devoted to the subject. Yet there is room for discovery.

My sketch does not contemplate an argument on the primitive strata, but I will here say that my poor ideas refuse to comprehend a sentence which I find in a little book called “Our World; its Rocks and Fossils :”

“Men of science tell us with confidence that the first really solid ground was granite, a hard fire baked substance; one that God had prepared in the interior furnace of the globe for the especial pavement of the water covered world; and having so prepared the granite, its stony masses, miles in thickness, were driven to the surface of the globe, and under the waters piled over its hot surface in mountain heaps.”

I also find it difficult to comprehend that basalt is of igneous origin.

Basalt and granite are, however, the first dry lands upon which the grass, the herb and the tree grew, or upon which the light of Heaven first gleamed.

I will make but little distinction between them. Granite and basalt contain similar mixtures. Basalt is a hard, colourless, dark rock, such as would be formed from the water, ere light gave her colours to the world. It is of a fine grain, and occurs in horizontal, vertical, or columnar forms. Sometimes solitary rocks shoot out of wide plains, or the columnar masses rise from the sea.

It has puzzled geologists to account for vertical and horizontal basalt in the same formation. The shape of the columns in the Giant's Causeway has also been a subject of much inquiry.

Now if a heavy porous weight is placed upon a soft matter, that matter will escape from below the weight through the first orifice that opens. Suppose, then, a mass of liquid mud, the washings of troubled seas, collected in a basin of rock

at the bottom of the sea, and over this liquid mud a covering of a firmer matter is collected. As this covering sinks by its own weight, and by the pressure of the water over it, the liquid mud forces its way up through the covering, which sinks down in proportion to the quantity of mud that has risen. The nature of this rise was in globules; but as many of them rose together, each globule retained its situation; but being pressed by its neighbour, each assumed the shape of an hexagonal prism. Each globule then attained the height above the substance that covered it which the pressure demanded, or the quantity of mud allowed. The perpendicular rise being unobstructed, some globules became taller than others, and some had unequal sides.

Year after year, or season after season—the length of which I will not pretend to fix—the pressure was renewed, and the supply of mud came up again — the original holes through which the mud escaped, being the weakest part of the covering, the globules of each succeeding

season were forced up through them. The hectagon of the former year had now become a firm mass, so that the fresh mud did not adhere to it, but pushed it up, and proved by a concavity on its upper surface, that the first globule of mud had become a hard mass, while its lower extremity still retained its convex form.

I could not better illustrate this principle of nature than by reversing a coarse sieve, and placing it over a mass of prepared material, it would be found that on pressure, the mass of matter would rise through the orifices, and would assume the shapes which the contiguity of the next globule allowed. We see the principle in the mud which crops up from our water pavements, in the water that bubbles up through the rock, in the petroleum oil which rises through the strata above it. We apply it to our gasometers and our pumps. The lava principle is quite different—it is spasmodic, and much more violent, and it appears to me an absurdity to suppose that the effects of volcanic eruptions could be restrained

to equal measurement, or to such a measurement as we find at the Giant's Causeway for several consecutive occasions.

As there are several separate, though similar, structures of basalt in this region, and some of them high up in the limestone rocks, I conclude that lime was the material which, constantly growing in weight, pressed down on the slime pits below and drove its matter up into the shapes and forms so curious, but so expressive of this natural arrangement.

There are vertical columns of basalt rising from horizontal stratified rocks, of the same nature. These vertical columns owe their position to a process similar to that just described; the superincumbent weight forced up the liquid mud below, through a mass of congealing hardening matter of considerable thickness. This liquid mud did not come up in small globules, but in jets or spouts of considerable size, varying in different localities, and attaining the height we find them. These formations owe their elongated shape to a

more sudden and a deeper sinking of a thicker cover than the smaller laminated square or many sided ones.*

The flat, tabular, stratified Basaltic rocks of wondrous size, of great height, and extending over many hundred miles, are nothing more than the ordinary fine deposits of mud laden waters. The varied thickness of these deposits shew that the materials held in solution varied in different seasons, the supply was always unequal, and this inequality is traceable in the thickness or thinness of the stratas.†

Granite is a coarser substance than basalt, but of similar formation, formed from broken rocks, by an ever moving water; one locality produces granite, another basalt. The grinding powers of some waters are stronger than those of others, the coarse grain is left by one, the fine grain by

* This principle is exemplified by driving lead into a gun barrel; it comes out an elongated plug.

† We have been told that Basalt forms the surface of many thousand square miles in India, where there is no trace of any crater or other volcanic action.—Proceedings of the London Geological Society of 1833.

the other. It has been found that the materials of which granite is composed vitrify when subjected to heat of human invention; why should not granite have been vitrified by the far greater power of volcanic heat—if formed from thence—even in the thin fragments of granite, which, if originally manufactured of that size, must have cooled quickly? we find no signs of this proof of burning. Granite, moreover, is of more modern creation than basalt; it has colour, and no colour could, I believe, come without light. I will, therefore, fall back upon nature, and express my belief that this rock is nothing more than a deposit from waters constantly at work, and sending its worked up materials to the bottom. The process is going on now; I believe it has been going on for ever, and as granite is of various dates I see no good reason to call fire to aid in the creation of a substance, which can be created by other means, more in accordance with the simple laws of nature.

Our geologists have looked at granite, and

compared it with other rocks of known sedimental formation, and of known igneous formations ; though they have discovered more important discrepancies between the latter than between the former and granite, yet they give the credit of its creation to heat ; but there is no position that it has assumed, which may not have been gained by water better than by fire. No one could say that the junction of the "hard-baked substance" granite with limestone rock, as shewn by Leyell in his manual (page 443, fig. 492) could not have been accomplished better by water than by fire. If the granite was there first it must have hardened from its fused state before the water deposited lime came into contact with it, so that the soft could not have entered into the hard ; if the limestone rock was there first why should the melted granite enter into its hardness ?

Under my water system, where both are yielding together, the junction and the intertwining are natural, the blending of granite with many

substances can only be accounted for in this way, and my poor reason declines to accept its origin from fire.

I am fully aware that books have been, and may again be written with the hope of proving that fire had much to do with the making of this world. Without stopping to argue on so hopeless a question, I will now reply to the question at the beginning of this chapter.

They grew upon the rocks of basalt and of granite, fostered by

“That gardener, who with careful eye,
Looking on them from above,
Bids the softly beaming sky
Protect them with its warmest love.”

In every crevice, on every ledge, within each hollow place, the grass, and herb, and tree had grown, we may assume that the sea also was producing its weeds about the same time, so that a yearly refuse, from both elements, was being added to the rocky peaks from which the waters were subsiding; slowly the earth grew, and slow

the peaks sprung from the waves in Asia, America, Europe, and Africa,—in all regions the gathering of the dry land was going on,—in all regions the water was retiring to its prison, but as it gradually sunk into the places, from which it had moved the earth, it left behind it new matter—the debris of growing nature—upon the new made rocks. As this matter increased yearly, so did the dry land continue to grow—organic remains soon added their vast accumulations to the growing world, there were soils of divers kinds, the decomposed granite, and the crumbled basalt, some stolen by the wave from the mountains it had made, and some gathered from that deep womb, which had already supplied so much. No sooner was a soil made than the universal law was applied to it—the yearly plants grew upon it, and variety of plant produced variety of life; they, each in turn, contributed to the making of dry land, till in time the variety of soil, and the variety of organisms became a vast confusion.

D

Through this great growth, and all over the increasing world

“ The water sparkled in the rills,
Where wild beasts only found retreat ;
The flowers grew wild upon the hills,
Where wild bees only found them sweet.”

Every stream helped the world to grow, no sooner did it trickle down the slope than it was converted into an agent; at all times it was at work, now carrying down little floating things, now loaded with thick red or yellow mud ; then, as life grew, it yearly carried off the bones and the refuse of animal life, and all the time, whether in flood or as a mere trickle, it was grinding into boulders, into pebbles, into sand, the rocky fragments which came within its overpowering embraces.

Into this wondrous region, which had grown of itself, this beautiful composition of water and of soil, separated from one another by these laws, which the universal Creator had ordained, upon which He had in a merciful and godlike gradation deposited everything in its proper place, and

having, after a patient trial of each, found everything that He had created "very good," He introduced man as lord of all, to have dominion over everything that was created.

CHAPTER VII.

" Look round our world ; behold the chain of love,
Combining all below and all above.
See plastic nature working to this end,
The single atoms to each other tend,
Attract, attracted to, the next in place,
Form'd and impell'd its neighbour to embrace.
See matter next with various life endued,
Press to one centre still "

DHAWALEGERI is, at the period I wish my reader to picture to himself, at a considerable height; its aspect is changed, and is changing yearly, its rounded summit has disappeared, and rugged rocks lift up their heads on high, great precipices are conspicuous on its sides, and deep scarps shew their abrupt faces along its front,—great masses of rough broken rocks, sharp pieces of black

basalt or trap encumber its ravines, and cluster in monstrous masses at the feet of the precipices. Then comes an abrupt slope, upon the face of which are the marks of many avalanches, deep and broad lines of devastation, shewing how nature conspires against those lofty hills, and how it labours day by day to reduce everything to its level.

These ruined spaces have a sudden end, for another high scarp runs across the line of ruin, and at the bottom of that scarp is a tangled mass of bush, tree and rocks; these are the materials that left the ruin on the slope above; they have fallen down from the weather beaten, sun cracked heights, and form, where they now rest, a chaotic mass that looks as if it would remain there for ever.

Let us consider how this change has taken place in my water-born mountain: as the waters left the dry land, they still hung, with wave and tide upon its breast; they were constant lovers, and though perpetually forced to retire, they

never did so without some memento of their rough embraces. For long ages the never weary tides had flowed backward and forward ; in every visit they had added to, and taken from the land that they beat against ; there was a perpetual system of give and take.

The rain fell, and that, too, washed away matter from the surface, which the waves could not reach.

“ Here gently runs the silver stream,
In changes frequent like a dream ;
Untaught, unruled, it trickles down
The gentle slope with lilies strewn ;
Or like a sheet of liquid snow,
It rushes headlong down below.”

A white ribbon of destruction and of creation. Falling over those lofty cliffs, which the retiring waves have left behind, my little silver stream washes away the soft earths, which long ages have deposited upon the hill side, and scoops out a deep ravine for itself. High up on its overhanging bank are those great masses of black tangled rocks, and, as the rains fall, and the soil

upon which they rest gets soft, a large fragment of land slips into the ravine.

Now comes the tug of war in narrow quarters, hard black rocks shut up the little water, till it rises and rages in its increasing volume, it attacks below, on the sides, and above, in a laughing ruddy stream it surmounts the mass, and falls over on the other side, it wears away the edges, it undermines the bottom, and the little trickle over the top having excavated its basin down below, the huge mass is overcome, and topples headlong into the gulph, broken and prostrate; one large rock fills the basin, which the stream had excavated, and the water flows by its side. To all appearances, that rock is safe, but its insidious neighbour longs to have it all to itself. On its surface is a slight hollow, in which accident has lodged a pebble; every now and then, when a heavier flood than usual comes down the rivulet, the water invades this hollow, and washes the little pebbles round and round, till the hollow place is a large circular bowl, and the little pebble

is ground to dust, but other fragments are now lodged in the hollow, and all working away together, they at last excavate the big rock to the bottom, its thin sides soon give way, and the mass of hard blue basalt rock is gone away upon the waters ground to the finest sand.*

There are other things for the little streams to work upon, and willingly they worked; carrying from the hills the produce of nature to fill up the waters below, to aid their great parent in its perpetual building. The scene which I have attempted to describe as enacting in the regions of Dhawalegeri, was and is going on all through nature. Let us try and imagine the progress, that was then making, on the site of these British Isles. While the north east and north west currents of the ocean were aiding Dhawalegeri in building the regions of Asia, what was there in these western seas to coax our dry land from the waves?

* This sand is an article of commerce for the manufacture of glass ornaments. The Taptie river in Khandesh furnishes large quantities.

We are now situated in an eddy formed by the great gulf stream. This stream runs 'up strong to the extreme west of our islands, and some of it returns to their east, but on this side there are other causes at work to keep up the balance of power; I allude to the great rivers, the Rhine and the Elbe, and stray currents, which might have affected these regions from the Baltic sea.

I believe that these causes were at work long ago. A glance at the geological map of these islands tells us that they were made by currents, eddies, and whirlpools; there are deposits of matter left from those old days, which tell us how the streams of water deposited them; there are banks of matter, which tell us, that eddies lodged them where they are, and there are collections of matter scattered through the land, which tell us of the gathering by the whirlpool.

We have, within our shores, metals and minerals of great variety, rocks of almost every description, sands and clays of every sort, soils of

infinite variety; well may the author of the heading to this chapter have called all this "the chain of love" given to us by our Creator.

This chain runs from the beginning of creation up to the present time. It is still lengthening, and the links of love are offering themselves daily to our wondering eyes; nothing can be more beautiful than the way in which everything produced upon earth and in the sea comes again in *plastic* form to add its mite to the great circle, there is nothing more wonderful than the system, the law of separation and attraction. Man can form nothing where the single atoms tend to each other, as in our granites, our slates, our marbles, and our flints. He could not separate whole regions of green sand from white chalk, he could not make a colour rise from the earth into the red rose or the green grass, neither could he perpetuate those colours by fixing them in the rocks and in the sand; he could not make the minute Diatomaceæ, that strange link between mineral, insect, and herb, neither could he arrange

that the remains of this organism should press into *one centre* and help to build the world. Man could not gather the materials from the waves, and build up strata after strata of different substances ; neither could he cause these substances to embrace the various kinds of life, the remains of which are found within their bosoms, all pressed into one great centre—the earth—of which these islands are a portion.

CHAPTER VIII.

"And it bubbles and seethes, and it hisses and roars,
As when fire is with water commix'd and contending ;
And the spray of its wrath to the welkin up-soars,
And flood upon flood hurries on, never ending."

SCHILLER.

In the last chapter I shewed how the water is perpetually wearing away the hard rock. I propose now the much more difficult task of explaining how it brings its varied materials together and builds them up again.

I must beg my reader to come with me to the stream, and we will pick up as we go varied materials—sand, gravel, clay, chalk, cinders, any thing you please. Well, we have filled the bag,

and here is the water before us clean and bright. Before us is a clean sandy yellow bottom, with a small gentle curling stream washing over it. We will throw in a handful of our mixed materials. Now watch them—the cinders, you see, refuse to sink entirely, though atoms fall from them, some of which float, some sink, the chalk crumbles, some fragments sink, some wash away in a white dust, and some are lost in solution; the clay sinks to the bottom, but when there it washes away, and you will observe that it all settles down again in different plots on that opposite slope, where a little eddy shows its curl upon the stream; the gravel sinks at once, and remains where it drops; the sand, there is a history in that, a whole book, if I were making a picture instead of a sketch. That large boulder that I mentioned in my last chapter subscribed some of it; flints ground down gave some; mica, marble, and slate, and sandstone, every strata through which the stream has run, every strata of which the distant hills are composed have contributed their

share ; all hard undissolving materials form sand, when broken and triturated by the moving water.

Look at the sand passing through the water, some bits sink straight to the bottom, some waver and hesitate as they go twisting and turning, averse to reach the inevitable level. (It is this quivering of a sinking substance, this hesitation of the small coin thrown over the ship's side, that enables the divers of Malta to catch the sixpence before it reaches the bottom.) There are other little fragments that scarcely attempt to sink, but wander on beneath the water as if they belonged to neither air nor earth, content to move on, erratic substances wandering in search of a home, here again are little fragments that refuse to sink, and float quietly on the surface of the stream, but watch these carefully, you see as they become saturated with water they also sink, but as they reach the yellow sand they roll on till meeting some obstacle they are stopped. Every one of those materials you threw into the stream have found their respective resting places ; no two of

them rest together ; each was of a different weight, a different substance. The water was of the same strength, and wafted each according to its weight or quality, some of them entire, some of them dis-united.

Now let us throw in something more, some of this earth from the bank. There, with the exception of a few crumbling bits, it has gone to the bottom ; but watch the action of the water upon it, see how quick it dissolves ; there is a whole stream of materials running from it, there are living things twisting and struggling, small bright dots or atoms glancing down the stream, almost rising to the surface, then there is a darker line carried along the sand, it sinks into it, and is lost to view ; all that remains of the handful you threw in are some little fragments of stone, and they, too, move along over the gentle smooth slope of sand, impelled by the stream ; every varied atom of that lump of earth is, or will be deposited in a separate home.

Did you hear that noise ? There it is again,

louder, reverberating through the deep ravines, and against the jutting cliffs of the mountains. See that thin fleecy cloud just issuing from the valley, below the line of clouds that float round the brow—there is a thunder storm going on in the bosom of the range. If you do not mind a walk and a wetting let us cross this spur and go to the big river in the next vale. The climb is rough, but the material these hills are made of is commonly called trap,* which means a step; we need giant's legs to step up some of them, but whenever a high step exists we are sure to find a path amongst the broken bits at the foot of it. Some have told us that this rock was made by fire and sent boiling up upon the earth. I do not believe it! There is no slag, no vitrification, no signs of burning, no signs of its having been a molten mass; it contains materials liable to melt with heat, and if it had endured heat sufficient to send it out from its

* Some have called them basalt and some sienite—each of these contain substances liable to form glass under the action of heat.

furnace into these mighty terraces of hundreds of miles in length, those materials would have melted them as easily as they do now, when converted into glass ornaments. While climbing up, let us examine carefully some of the fresh broken strata. Here is a projecting slab, beneath it is a substance which is not trap or sienite; wet it, you find it a tenacious plastic matter. Here, on the surface of another split fragment, is some more of it, but very thin and delicate, spread over the entire surface like a fine film—break off a bit of the overhanging rock, and there it is again—this substance is lime, dark it is true, but still lime, and is easily accounted for by the deposit of the black mud rock in certain seasons, when the fine sediment of a universal water was washed up; then when a quieter season came, the still waters deposited from their never failing bosoms the lime which they held in solution. However thick the deposit may have been, these thin filmy streaks are left between them as witnesses to the fact, that the trap rock was not a molten one, and

that it was deposited by water in strata or steps.

Now here we are on the bank of the great river; the air is thick and sultry, insect life is still, the fishes do not move upon the water, and see! yellow flakes of foam are already skipping over the ridge of the waterfall; they have been driven ahead of the water by the wind, which you can now hear coming down from the mountains. There are coloured streaks of liquid interlining the silvery fall, contributions from little streams, and staining its spray with cloudy colours; now comes a heavy rush of turbid water, pouring over the fall in one broad tumultuous mass; its heavy thud, on the pool below, sounds as if the mountain itself had fallen into it; simultaneously the lightning flashes, our hair crackles with electricity, the thunder rattles with the flash, and large drops of rain fall fast and thick. The roar of the water drowns the thunder clap, the surging waves come tumbling over the ledge, till the vast basin down below is

full, and the fall is now one vast mass of bubbling seething waters. Upon its roaring bosom vast quantities of refuse are brought down—trees, bushes, grass, and refuse of all sorts—there are animals still struggling in mute despair, and carcasses floating down in death, but moved convulsively by the conflicting currents. Their duty is not forgotten in this apparent confusion, and the deep hollow of the water worn basin is now converted into a wondrous whirlpool.

The storm continues, and the flood pours down its hissing, roaring waves; we can hear, through all the elemental din, the crash of some huge rock as it tumbles over the water-buried ledge, and a heavier pulsation throbs over the curling water as it falls within it. Animal after animal is drawn into the unsparing vortex, tree upon tree broken and torn, is whirled round in endless circles, and as the circling masses meet with contending eddies on the edge of the whirl, thick masses of dark spray soar up with the clearing atmosphere.

The force of the flood diminishes. It has done its duty, it has filled up some of the hollow places which it had created, and the river flows on in its silent grandeur, thick, and never ending, to deposit some of its spoils far away down its course, or farther still on the confines of the ocean.

The heroic victim of Schiller's song went down into one of those collections, which have for so long been a puzzle to our naturalists and geologists,—a puzzle now no longer, as their history is fully explained in my "*New Pages of Natural History*"—collections which have been made by every river that ever sent its waters from the hills; collections which testify most truly to the wondrous accuracy with which water labours; collections which, soft, yielding, and decaying, have yet formed the centres for our mountain arches in our limestone rocks. The centre, the nucleus, the arch, and all the rough mountain rising far above the hidden burials, being fabricated and composed of shells, and bones, and vegetable matters, all

conglomerated into the one great mass, which sternly frowns as if it had been a mountain for ever, and utterly independent of the adhesive matters which, while in life, were sustained by its herbs, and in death contributed to its strength. Man is constantly discerning these hidden bones, and tells us with all gravity that the hyena placed them there.

And here I will introduce another deposit, which has produced graver remarks than our limestone caverns and their contents. Our metalliferous veins have given rise to many and conflicting arguments, but I will allow Leyell to speak for himself. In "Elementary Geology," p. 496, I find: "*We know that the rents in which ores abound extend downward to great depths.*" Now these lodes of metallic substances occupy long lines in the bosom of rocks, these lines are of varied breadths. Leyell tells us, p. 491, that "*the opposite walls of veins are frequently polished and striated, as if they had undergone great friction. We may attribute such rubbing to a vibratory*

motion known to accompany earthquakes, and to produce trituration on the opposite walls of rents."

Leyell imagines that these rents were made by "*mechanical violence*," but the veins of metal "*held their course continuously in a certain prevailing direction for miles or leagues, passing through rocks, varying in mineral composition.*"

So then the mechanical violence must have been most equally applied to keep straight lines for long distances, through "*all kinds of rocks*," and in p. 492 he says, "*the parallelism of the veins is another reason for regarding them as ordinary fissures.*"

Now these fissures, full of one metal, are sometimes intersected by fissures full of another metal, and the continuous line of each vein is frequently interrupted. These interruptions, or shifting out of one straight course into another, is accounted for by Leyell at p. 491, by "*we must next suppose the shock of an earthquake to occur.*" And so these earthquakes may go on and interrupt the continuity of the veins as often

as they please; but they do not destroy or break up the vein, they only heave the veins out of their places. Leyell fills his fissures with minerals by "*sublimation from lakes and seas of igneous matter below*," p. 489.

According to this principle, then, we have earthquakes fracturing rocks, and molten matter from below rushing up into the fissures, much after the fashion of water rushing up into an artesian well. This molten matter is always ready, and rushes up whenever a fissure is to be found. The fissures must, however, have been filled before the fractures took place, so that we may ask if all the metal at hand was molten and sent into the cavity by the first convulsion, what has become of that which was not sent up? It would be a very curious fact if the fissure was made by an earthquake, exactly of the size sufficient to contain the molten material that was ready.

I may also ask how, if these fissures were each filled by one injection, in the manner described

by Leyell, how could the sides of the fissures be polished by the working of substances which adhere to them? This polishing by the momentary vibration of the earth, is more ingenious than correct. If these metallic substances had fitted into the fissures, as a bullet fits into a rifle, there might have been a shadow of truth in the theory; but as they do not, I come to the conclusion that there is no truth in the theory that the fissures were made by volcanic action, or that they were filled with metallic matter by sublimation, or by the force of fire. Earthquakes would not split fissures in rocks of all sorts, with polished sides, of even breadths, and regular or irregular cavities; but I believe I can tell what would cause the cavities, and at the same time fill them.

My ever-busy agent, the water, with its wondrous faculty of collecting like to like, had collected, does collect, and will collect masses of similar descriptions together; I have shown how the eddies and whirls work. Some of these had

collected the tin, the copper, or any other metal suited to the occasion, into their under water chambers; over these, the granite, the slate, or any other mass of water deposit, settling gradually down, weighed heavily on my metallic collection. It was surrounded on all sides, and on being pressed, rose gradually through the plastic mass above it—the great force of the pressure caused the rising material to rub firmly on the mass around it, and from this original rubbing came the smoothness of the walls which we find containing the metal.

All the rising took place while the whole mass of matter was soft and under water. As the water left it, it hardened. Then, and not till then, did the earthquake affect the indurated rock, and this cause may possibly have cracked and heaved the veins out of their continuous course. But there is another more simple, more natural, and more probable cause for this common feature in our metallic veins.

E

As plastic matter settles into rocks, there is a hardening, a settling and a contracting. There may be unequal pressure from above, or uneven foundation down below. Either cause would be liable to produce a fracture and a slip. The regularity of these slips induces me to believe that this self-fracture has acted on these metallic veins, and not the volcanic action. There would be no necessity for uniform action in the indiscriminate flurry of an earthquake, while my system imposes a degree of unavoidable regularity—a regularity which is remarkable in the shifting or the heaving of our metallic veins.

Geologists have disputed much on the relative age of metals. I believe that they have existed from the beginning; that they are component parts of earth; that they have been forming in all time, are forming still, and will go on forming for ever; that as long as materials are produced upon earth to keep up this supply of metal, so long will water find time and opportunity to

separate it, to lodge it, and to collect it. Volcanic fires may find it, fuze it, and send it to the surface ; but if man waits for these accidental catastrophes, he will soon be without the metals for his daily use.

CHAPTER IX.

Quick brightening, like lightning, it tore me along
Down, down, till the gush of a torrent at play
In the rocks of its wilderness, caught me, and strong
As the wings of an eagle, it whirled me away.

SCHILLER.

THE poet must have studied the working of the waters with the eye of an artist, for he has, in the above lines, made his diver tell of the by-play of a whirlpool, which is not often witnessed. Everything sucked in must revolve in the outer circle first, on the confines of this circle are many *gushes* of water issuing from the main whirl, these gushes give one the idea of *play*, for they sometimes rush back into the whirl, and sometimes rush, with a strong swirl, away into the main

waters,—these gushes frequently release matter from the whirl, and advantage has been taken of this fact, to shew to the diver “on the spikes of the coral the goblet of gold;” the cup and the man had been seized in the same gush, and he “baffled the death !”

The storm of yesterday has cleared the air, the river has subsided to its usual bed, but if you please we will continue our walk by its banks, and see what the whirlpool of the great falls has sent out on its gushes to satisfy the eddies down below.

I must remind my reader that though I am writing of things familiar to me in a tone of intimacy, yet the events I wish to pourtray are those which happened long ago.

These islands were just emerging from the sea, and the causes I have before mentioned were rapidly aiding their growth. I will now suppose that I am on the banks of that great river now called the Rhine, and will endeavour to shew you what it was then doing.

The high water mark of yesterday's flood has extended over the banks, and over the plains beyond—it was a mighty flood. There, upon that mound, stood a village, of which every vestige is swept away; but the people have escaped, and see they are busy looking for their food, their underground stores have been broken open by the remorseless water, and they are destitute of their usual corn. Here and there, lodged against trees, or under banks, are the torn remains of various animals, chiefly of those which inhabit high lands, and from these the bereaved inhabitants are preparing their meals. Lower down we come upon a wide water, upon which we take boat—a rough, awkward affair—but it will land us on that great bank which I wish to examine.

As I expected, it has been much denuded by the flood, and see beneath this limestone tablet, which was probably broken yesterday, are heaps of bones, great and small, all heaped together in vast confusion; their surface has been washed

clean, but that remains which explains the history of all.

The eddy which composed this bank was formed by an island, which tradition says was washed away long ago, and now that an opening has been made, this that we stand upon will soon follow.

This bank is long and narrow; on one side it is steep, on the other side shelving; one end is abrupt, the other of a very gradual incline—this is down stream, the other is up; the shelving side is that upon which the water exercised its mildest force; the steep side is where the strong river swept its currents close along side of the eddy, and swept away all such materials as, falling from the higher ground, fell into its stream—in other words the stream kept that side of the bank nearly perpendicular.

In this side there were slight curves and bends, shewing that the river stream had its seasons of irregularity; the whole bank was covered with a limestone coating.

This coating, you will observe, is now broken, we find that it is hollow down below, and the water has found a vent at the other end; quantities of materials have been washed away, but some bones are here—bones of great beasts, elephants and rhinoceroses—which with those of many other animals have been washed down from their pleasant feeding grounds on the Alpine regions years ago. Every year these floods take place, every year destruction goes on in one region or another, sometimes more and sometimes less. The bones below us were washed down long since, inside the skins of their owners, and see some of the bones are shattered, broken in the river falls, or crushed by rolling rocks; as we move them, we see that they are wonderfully preserved; the flesh is gone and has vanished into this fine black oily, loamy soil, which is so mixed up with the bones. Digging down we find the bones more broken, and some of them rolled on their convex sides; these are not of such freshness as the first, and give evidence of having

been long subjected to the effects of the atmosphere.

How came these bones here? We see that some of them bear upon them the marks of teeth, and it is very natural to suppose that the animal which gnawed them did so upon the spot; but the animal which you suppose did so, has left his bones here also; here is the cracked skull of a great hyena, with teeth well worn, and rounded by gnawing of bones.

But the idea that he brought these bones here will not do. The beast does not make a golgotha of his den, and he does not eat his own kith and kin. He had plenty to eat; every vale was full of food; on every hill he found his prey. He and the old vultures tugged together at the elephant as he lay upon his side dying of sheer old age; he eat his food where he found it, and sometimes slept by its side, till a little hunger enabled him to begin again. There was but little occasion for him to have a den. Man, his only enemy, was not plentiful when the owner of that

head lived; and he, that scavenger, that useful animal, that had left upon the hill-side millions of well-picked bones, to be converted by atmospheric influence into dust, and eventually into limestone rock—he, I say, was carried off by such a flood as yesterday, when every little valley sent down its contributions, till the big river bore upon its heaving waves thousands of carcasses, millions of bones, whole forests, and whole villages—everything but man.

Man, though few in number then, had a reasoning soul, and that reason was in those days applied acutely to the actions of nature. This had taught him to live upon high grounds; the waters were large and dangerous, the yearly floods swept all before them, and man had frequently to escape in any way he could. This is the reason that kept the remains of man out of these bone collections—that is, if man was!

I have said these remains are well preserved; this preservation is due to their covering. When the waters, which placed them there, began to

resume their usual channel, the ordinary sediments of the water sank and settled down. In those days bones laid upon the earth, "like as when one cutteth and heweth wood," all such as were not washed away into the receptacles of the whirl or the eddy, bleached and decayed where they rested, and eventually becoming lime, were gradually taken off by surface washings, into every rivulet and brook, till the entire water seems to have been saturated with lime materials.

The floods carry off many consignments. There are the animals of the swamp and morass; these go first, then those that frequent the ravines and the dells, then those that are caught upon the deluged plain, and then the animals that may have sought a useless sanctuary.

It is wonderful to see the confusion that reigns in the wild beast creation during a flood or a fire;* the strongest and the fiercest lose all desire

* This confusion seems to affect our tame animals. At Castleton, North Berwick—two horses frightened by a thunderstorm "went over a precipice several hundred feet high, near Tantallon Castle."—*Land and Water*, 30th May, 1868.

of strife. Their only thought, their only instinct is escape, and while blindly attempting that, they plunge headlong into danger; then the moment they think they have escaped, their cunning, but not their ferocity, returns. I have known the wild boar and the panther so scared by fire as almost to take man for a friend.

Each detachment falls upon a different current, and is liable to a different place of deposit, but all down these great rivers, all along the course I am now talking of, along the Hartz mountains, all along limestone formations, wherever fresh water or sea water has deposited these rock masses, there we find these animal remains, carried down by the gushing stream, hurled and broken on the rocks, and in the rapids, and eventually deposited in our gravel drifts, or as nuclei for our caves.

Recollect, my river is high up, but its mighty currents run on, and mix with the wide sea of waters; the contribution takes off the saltiness,

and its deposits sometimes are those of fresh water ; its contributions of forests float upon the wide and wind tossed wave, till they are eventually lodged where we now find them, by eddies and by whirls ; its contributions of dead carcasses float on, upon the unwilling tides, till they are seized by the gushing stream, or the giddy whirl, and lodged in banks or hollows, where the water then quietly buries them with its deposits of lime in a grand mausoleum, composed of the bones of their quondam neighbours.

All down the course of the water shed I allude to are many of these great cemeteries. They are continued into our own land, and I have no doubt but at the time I speak of, when our highest lands were fast rising from the waters, that the currents, the whirls, and the eddies formed by the Gulph Stream, and this water shed, brought upon their heaving bosoms from the distant Alps and other feeding grounds, the original owners of these remains.

Lodged, then, as we find them now, these de-

ooying remains became the resting place of the lime sediment, and this sediment, settling down year by year, grew in time to be the great hill above our bone caves—a hill that makes any ordinary visitor imagine that water never could have got there, and even leads our greatest naturalists and our most acute reasoners to imagine that other causes than water have buried these remains in the places where we find them. It is my belief that this system helped to build up our hills in the way I have described, and in wafting to them the materials for building, found amongst the plentiful refuse of the earth fragments which unknowingly gave their aid to build our caves and grottos—those supernatural places in which strange spirits lived ere man ventured in, and which for long ages have been looked upon with dread and superstition.

Our greatest authorities and our deepest thinkers are unwilling to believe what they do not see ; even the independent Duke of Argyle, in writing of the cave at Brixham, and of the stream which

must at one time have run over the spot, enquires "Whence can this stream have flowed, and whither?"

Now this is precisely the case, which I have described in "New Pages of Natural History," as existing in the valley of the Ghora River; the water level was higher once than it is now, denudation and destruction have blotted out the course of, but have left some of the collections from the stream to prove to our unwilling senses that it once was there.

Hugh Miller tells us in page 62, "Sketch Book of Popular Geology," "*The want of lines of caves still higher than those of the ancient coast line would seem to indicate, that though the sea may have remained long enough at the various upper levels, to leave its mark on soft, impressible materials, it did not remain long enough to excavate into caverns the solid rocks.*" Here is a sentence which enables me to prove my point more clearly than I have already done.

I prove—first, that there were no soft materials

in the upper strata for the action of the sea to wash away and leave a hollow cave; secondly, that the sea was unable to excavate the hard, upper rock into caverns; thirdly, that if it could not excavate the hard rock in one place we may doubt its being capable of doing so in another, and consequently, that where the sea has washed out caves there were soft materials for it to wash upon.

Hugh Miller did not know how long the sea wave beat against that now lofty scarp, but it beat long enough to wear away a considerable portion of the mountain side. We may, therefore, rest assured that if the soft materials had been treasured up along the levels of the upper coast lines, some of these treasuries would have been broken into, their contents washed out, and their cavities would have been displayed; as such is not the case, I come again to the same conclusion that I came to before, that the hill tops over our cave lines have been deposited slowly and gradually by water, by winds, by

growth of herbage, and by refuse of animal life, and that the foundations of these hills were laid, when the Spirit of God, moving on the face of the waters, raised these islands beneath them by burying and treasuring up in these localities, vast accumulations of earth's productions.

CHAPTER X.

"It is not yet fyfty years ago syns the fyrst man, as far as men have heard came to London, that ever parted the Gylte from the Sylver, consumynge shortely the Sylver into dust, with a very fayre water."

SIR T. MORE'S DIALOGUE.

WE have advanced in the art of separating and refining metals since those words were written, but I do not think we have advanced much in our knowledge of the separation, and division of minerals, or metals while in their normal conditions. Our acquaintance with chemistry gives us such facility and such certainty in the analysis of all substances, that it is quite natural for us to assign to it the effects and results which we discover in nature. The accuracy with

which our scientific separations are made, lead us at once to the conclusion, that nothing but the same causes, could effect the divisions which we see before us; there are many such, to which I cordially consent, intricate, beautiful, and merciful chemical changes, and affinities beyond the comprehension of man, and others brought about by the laws of creation, but in some of these there is no occasion for chemical action; simple nature brings about its own changes, its own affinities. Some of them have been so tortured, so forced out of their simplicity, that I find it necessary to allude to one system in particular, as an example of the facility with which science takes the place of nature.

I am considering our chalk formations, and before explaining the system, which, to my poor comprehension, appears the only possible, and the only unentangled one, I will quote a few passages from such books as come to hand in reference to the theory which I refuse to accept.

At page 61 of a popular little work "The

great stone bed of Nature," Ansted, I find, "*Every thing seems to prove that the flints were formed by chemical agency; brought about during the temporary stoppage of a deposit of chalk mud, and while the pause admitted of a multitude of sponges and other marine forms of life being accumulated on the ocean floor. Perhaps some eruption of hot water, charged with silica, may have taken place from submarine volcanoes.*"

I now turn to a very popular periodical "Chambers's Journal" for April, 1868.

"*These layers of flints were formed at nearly regular intervals, the chemical action being uniform.*"

Further on we are told, "*It was evident that some earthquake action was at work over a considerable area. The sea bottom was being up-raised, and at length, what had formerly been ocean became an extended mud flat.*"

"*The upheaval went on, and the chalk hardened into its present solid state, and became a land surface.*" The writer of this article foreseeing

the difficulty of maintaining straight lines, under the usual sudden impulse of earthquake agency, goes on to say: "*Do not imagine that this upheaval was a sudden and violent process, as some have thought; on the contrary it was exceeding slow.*" "*not greater than at the rate of a few feet a century.*"

So, then, we had earthquakes, which caused rents and fissures in our granite, and other rocks, removing the metallic lodes out of their straight lines, while the earthquakes reserved for our chalk formations were not violent, and, keeping the lines straight, raised them a few feet in a century. But while the author is thus endeavouring to avoid the inevitable destruction of his straight lines of chalk and flint, by the commonplace and usual operation of volcanic action, he gets into the greater difficulty of maintaining volcanic power and earthquake agencies at regular intervals, and uniform action for centuries; saying, "*The upheaval still proceeded, until at length after century upon century had*

passed away, the solid chalk was lifted high enough above the waves to form a tolerably steep coast line."

This brings me to where I was bound, the white cliffs of old England; were they indeed made by chemical agency, were the flints produced by it? All that I can make out in the way of chemistry is, that silica, hot water, sponges, and a stoppage of chalk, induced the flints to grow, and then when sufficiently embedded, and embraced by their cretaceous neighbour, the whole was raised up for the express purpose of forming a coast line, by a slow and uniform process of volcanoes.

I find in Leyell's manual that chalk extends from the north of Ireland to the Crimea, some eleven thousand miles, and from Sweden to Bordeaux, some eight hundred or nine hundred miles, a tolerably extensive area for the uniform action of earthquakes. Then about the tolerably steep coast lines, surely the writer in Chambers' does not wish to instruct the reading public that

these steep coast lines of chalk were left in their present state by the earthquakes. If he knows that they continued heaving up the chalk masses for many centuries, perhaps he will be able to tell us when they ceased their regular performances, or when their season will begin again. To be serious, I will ask my reader to think of any chalk cliff he pleases, a high white wall of crumbling matter, cut out on the side of a hill, and in this white wall, not really at regular intervals, but at very irregular intervals, varying from several yards to less than an inch in thickness of chalk, there ensues a line of flint; below this flint-lined chalk, there is frequently, perhaps always, another layer of chalk, entirely without flints. Did the chemical agency act in one and not in the other?

I happen to live on hills with a hundred yards of flinty chalk below me. Lower down than this is another strata of chalk, harder, firmer, without flint—almost a pure lime. Now all this lime, chalk, flint, was produced by living creatures.

It was all brought together by water, and year by year the living masses added to it, till the water finding other levels deserted their heaped up mounds. I must, however, begin with the lower layers. Thousands of years ago the little chalk-forming animalculæ were at work in these latitudes in countless myriads, they increased and multiplied, and when they died they gave up themselves, and all belonging to them, to the mercy of the waves. Year by year, or season by season, the period of stormy weather came on, and gathered the fragments of the little creatures together, till vast masses were accumulated below water. At some ancient date these masses were broken up, and subjected to the same operation as my handful of earth in the clear stream; there were flints in it, and the chalk was common chalk, but after this breaking up and washing, the flints were disposed of, and the lighter particles passing on in solution, the pure lime particles were dropped and deposited where we now find them. These beds of lime are

found sometimes by themselves, sometimes beneath the ordinary chalk. This, as we find it, has never been subjected to removal, it lies where the waters deposited it in long past ages. These chalk deposits form undulating districts, and the chalk crops out to the surface. There are chalk quarries dug by man, and chalk cliffs made by the action of the elements—wind and water; the effect, though different in size, is the same; a section of an undulating district is cut away by one, a hill side is attacked by the other, in each we see before us an old deposit of organic matter, soft and friable, divided by horizontal or sloping lines of flints in long continuous order.

. In a deep chalk cutting in the hill leading from Henley-on-Thames to Remenham the usual flint lines occur, but in examining these carefully I find that some of the chalk layers are several feet in thickness, while there are two layers, not far distant from one another, scarcely two inches deep, but beneath each of these there is the inevitable flint; beneath the thin layers of chalk

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the flint is a fine flat line, while beneath the thick layers of chalk the flint is, as usual, of large size and all manners of shapes. In considering this subject I find that all the chalk and silicious matters were held together in solution, that there were periods of deposit, and periods of no deposit. During the latter periods weeds, sponges, and ocean plants grew upon the deposits last left, and were buried by the deposit next ensuing, together with any other substances which might accidentally have sunk to the sea bottom, such as shells or bones which might have been left there by the living individuals or by the dead. All materials resting on the previous season's deposit were, as a matter of course, buried by the deposit of the ensuing season.

This deposit, then, in the shape of mud, rested on the face of the old deposit, which had become firm.

The animalculæ which gave the matter for these deposits, and the fishes feeding on them, which also contributed their share in excrement

and bones, subscribed their quantum of silix, and as the animals lived and died upon the spot, this silicious matter was in the muddy mixture.

My thick layers of chalk, therefore, contributed silix in abundance, and formed the large flint stones below them; while my thin chalk layers contributed a very small quantity, and formed very thin layers of flint; but there is something else to be gleaned out of these thin and thick lines. The chalk and silix were all held together in solution, the latter, being the heaviest, sunk to the bottom of the season's supply; by the time it reached the bottom of the thick layer, the chalk surrounding it was becoming firm, but as the silicious matter continued to percolate downwards, it was prevented running sideways by the firmness of its chalk bed, and thus formed, on accidental nuclei, or upon nothing at all, the strange figured lumps we see; but the silix from the thin lines of chalk has assumed no shapes, it is merely a thin level line of flint, and I glean from this that while the thick layer of chalk hardened sufficiently

at its lower extremity to prevent the silicious matter finding its level, and so forced it into the shapes we see, this matter, not being so pressed by the thin deposit of chalk, was enabled at once to assume its level, and run smoothly over the face of the previous deposit. In the space open to my inspection, and visible still to any one who wishes to look at it, there were no excrescences, no sponges, the line of flint was as level as the line of chalk, and I look upon this fact as a clear proof that both were water deposits, and that neither thick nor thin layers of chalk or flint have ever been moved, as a rule, by any convulsion of nature, ever since they were deposited in the sites where we find them.

These are very simple and ordinary results of natural laws—the heaviest substance sank to the bottom; fayre water alone is the chemical analyser, and it has done something to the mass of material before it, previous to its depositing the chalk and its silex. In the vicinity of chalk there are generally beds of green sand. I believe

that these sands were originally particles entering into the composition of the animalculæ which formed the chalk, and these particles were drifted off the chalky beds by tides and currents as they fell from their owners.

It is quite possible that "marine forms" of life may have grown upon the firm surface of each season's deposit of chalk; but whatever they may have been, they were not always sponges which formed the nuclei of the silicious formation. I have before me a large chalk flint, broken; within it I find an irregular chamber, illuminated with the most brilliant crystals; in some parts these are sharp, in their original integrity, but in one place a smooth nodule protrudes into the cavity. This is not bright unless it is rubbed; it bears on its surface a yellow dust, and in the bottom of the chamber there is a lump of yellow loam, the colour of which extends over the whole rough bottom.

This yellow substance was the nucleus of the flint, which formed upon it, but this nucleus was

a hard substance for a long time after the first settlement of silicious matter around it, and the nodule was not formed till the flint had assumed consistency; the crystal drops do not percolate through at once; the lower part of the chamber is unrefined, the roof only is of refined silex, and this is produced by gradual filtering of matter; my nodule, then, gently oozing through the roof of the chamber, found its way into the concavity of some hard substance. In shape it resembles the cast that may be taken from the vertebra of a fish; but at any rate, no sponge could have offered sufficient resistance to produce the crystal nodule.

It will be obvious to my readers that the theory of volcanic action for the raising of chalk from the bottom of the sea required an inventive genius to account for the flints; chemical agency was at once resorted to, it satisfied the mind, and was beyond the reach of ordinary enquiry. I trust I have exposed the fallacy of the theory, and that I may induce my readers to believe that our steep

coast lines of chalk are not the result of volcanic actions, but merely the deposits of the waters which in former days flowed over our present locality, that these deposits extended through the seas, and possibly joined the undulating chalky lands on the European Continent, that floods and the natural wear and tear of the elements have brought them to what they are, and are every now and then taking away more.

At the time I am writing of, however, the accumulations were forming rapidly. These islands were emerging from the deep, slowly and surely. Ben Nevis, Snowdon, and Dartmoor, as they then were, may have lifted up their heads. Our granite, our slates, marbles, chalks, sands, clays, and limestone rocks may have been built, with all their wondrous treasures below them. The world was going on as our Bible describes it. Man multiplied upon earth, "and daughters were born unto them," and the sons of God "took them wives of all which they chose." "And God saw that the wickedness of man was great in the

earth ; and that every imagination of the thoughts of his heart was only evil continually," "and it repented the Lord that he had made man on the earth." "And He said, I will destroy man, whom I have created, from the face of the earth ; both man, and beast, and the creeping thing, and the fowls of the air."

So then, after all these ages of labour, after so much had been done, and behold it was very good ; after the dominion of all had been given over to reasoning man, it was discovered that he was not a just steward ; his office had to be taken from him, and the bad were to be separated from the good, as the flint from the chalk, by a very fayre water.

CHAPTER XI.

"And behold, I, even I, do bring a flood of waters upon the earth, to destroy all flesh, wherein is the breath of life, from under heaven : and everything that is in the earth shall die."

It was quite consistent with the whole system of creation that the same force which had been used to build up, should be used to overwhelm. It was a proof also that water was the strongest, the most applicable, and the surest force that the Creator and Destroyer had at His disposal. There was no change in the law of nature, but only a temporary and exceptional change in the manner of working of the law. The water had retired at God's order ; it came again at His will. And not the sea only—"the fountains of the

great deep were broken up," and "the rain was upon the earth forty days and forty nights."

Let us consider what this storm did. "*All the high hills that were under heaven were covered.*" "*Fifteen cubits upwards did the waters prevail;*" and "*the waters prevailed upon the earth an hundred and fifty days.*" Thus the earth, and all that was upon it, the creation of which occupied six days, was again covered with water in one hundred and fifty days. There is no reason that I know of for using the *day* of the flood in a separate sense from the *day* of creation. As this latter is generally understood to embrace a time unknown, it would not be unreasonable to allow an unknown time to the flood; but the whole history of it is so minute and circumstantial, and the measurement of time is given so accurately—"forty days and forty nights," that if the light and darkness were then, as they now are, of twelve hours each, we have to consider a great miracle, and the most wonderful example of power that has ever been exhibited in this world.

There are many things which are miracles only so long as they are not understood. It was a simple way of getting out of a difficulty, and thus events were called miracles. But a long time has passed away, and we are constrained to call the Deluge a miracle still. It was a catastrophe which exceeds the calculation of human minds, schooled only by the common events of life. Now and then an earthquake disturbs a locality, swallows up a city, and hurries a few human beings to an unexpected eternity; a volcano works rather harder than usual, and sends up lava* to overwhelm its vicinity; and, occasionally, a hurricane rages in its might. If, in these regions, we experience a harder frost, more snow, less rain, or larger hail stones than usual, they are all recorded by our meteorologists and philosophers,

* *What is Lava?*—The *Times* of October 16th, 1868, says:—"Here is an analysis by M. Silvestri, of lava recently thrown out of Vesuvius:—Silica, 89; lime, 18; alumina, 14; magnesia, 3; protoxide of iron, 18; potash, 1; soda, 10; water, 2—which means that the specimen closely resembled common wine-bottle glass."

It will probably be found that lava is nothing more than the melted stratas of earth, varying with the locality of the volcano which produces it.—H. P. M.

and we wonder at them till the next novelty of the firmament occurs.

I will ask my reader to suppose that at the time of the world I have come to (the Mosaic Deluge), Dhawalegeri was 28,072 feet high, and the waters covered this in one hundred and fifty days; we have then a rise of water equal to one hundred and eighty-seven feet per day, without calculating the fifteen cubits of upward increase. But "the flood was forty days upon the earth; and the waters increased and bare up the ark." If we take the rise of the water at the same rate all through the one hundred and fifty days, we come to a tolerably accurate knowledge of the height above the sea at which the ark was built. If we multiply the one hundred and eighty-seven feet by the forty days, it gives the ark a height of 7,480 feet above the sea before it floated. I assume then that the ark was built at this height from the present sea level.

We see by these measurements that when anything was to be done there was no difficulty in

doing it ; but as some authors have told us that the flood was only partial, let us look at it in that light ; we shall find equal reasons for wonder.

I will suppose that it was a partial Deluge, and that the mountains of Ararat only were submerged,—that they had reached the height of 17,230 feet above the sea (I may as well say here that they might have been higher, as the denudation was less then than it is now, but I will balance this by allowing a higher level to the sea) ; to this height I will add the 15 cubits, and make the rise of the water 17,267 feet in the 150 days, which gives us a daily rise of 115 feet, or 4 feet 9 inches per hour. Then, if we multiply the 115 feet by the 40 days, as before, we have a rise of 4,600 feet in that time, which would fix the site for the building of the ark at nearly one quarter of the height of the mountain. However extraordinary such a situation may appear to us now, it gives rise to the assumption that there

was a great difference in our levels, of which hereafter.

Our wonder at the rise of this flood will now be surpassed by a glance at its subsidence. The waters prevailed for 150 days, and "*in the seventh month on the seventeenth day of the month*" the ark rested on the mountains of Ararat, or 17,230 feet above our sea level; the difference between that height and the top of Dhawalegeri is 10,840 feet; or the subsidence had gone on at the rate of more than 140 feet per day, taking the month at thirty days.

If we look at the flood as only a local visitation, if Ararat only was submerged, and the ark rested on its summit, then the subsidence was only equal to the fifteen cubits in the two months and seventeen days; or, in other words, from the commencement of the subsidence till the ark rested on the Mount; this subsiding will be at the rate of about three and a half inches per day. This subsidence was, then, continued in a very

gradual manner for some time, as we are told that in the tenth month the tops of the mountains were seen; but after this the sinking was most rapid, if the heights are correct. Noah took it leisurely, and did not leave the ark till there was plenty of dry land; I will suppose that he waited till the waters had acquired their old levels, consequently the remaining two months saw the waters sink from the top to the bottom of Ararat, 17,230 feet, which at thirty days to the month gives a decrease of 287 feet per day.

I will leave my curious readers to reconcile these variations of subsidence, deduced from the Biblical account of the flood, and from present heights, while I place the subject before them in another light.

I will suppose the flood came, and that in forty days it had risen high enough to float the ark, which I imagine required fifteen cubits of water; as is, and was usual in ship building, I conclude the ark was built near the water; if then its draught was fifteen cubits, the rise of water was

gradual, as it is in long continued floods to the present day, being at the rate of about six and a half inches daily. If this rise was continued equally for the six months of thirty days, or 150 days, we have a rise of water reaching only to the height of about eighty-one feet, and the fifteen cubits, or twenty-two feet higher—say, in all to a height of 100 feet. Now, to suppose that this was the depth of water which drowned the earth, seems to us an absurdity. It will be seen by and by, that I argue for much higher levels of land and water in former days, and though we cannot suppose that the floods did rise in the equal manner I have painted, yet we may infer that they had no occasion to rise to the great heights, which the present elevation of our mountains would require; I accept therefore an ordinary rise, and an ordinary subsidence; I suppose that the mountains were not the abrupt and pointed peaks, as we now find them, and that the level of the sea was then much higher than it is now.

There is another point that I will touch on as

giving evidence in favour of this view. No mention is made of snow in the books of Genesis or Exodus ; I infer from this that snow was unknown. Our aeronauts tell us how the cold increases at a distance from the earth, and our mountain climbers know how soon the air cools, even in hot latitudes, as they ascend the mountain side. I infer then that there is a warm belt of atmosphere, which keeps pace with the general level of the earth ; consequently, in early days, this warm belt was much higher than it is now, and no snow rested on the inhabited portions of our globe, while now as the denudation goes on, and the general surface of the earth sinks, the warm belt falls with it, and the snow rests upon the mountains.

In whatever way we look upon the account of the deluge, the language, though precise and clear, is, when examined, utterly incomprehensible, and it is one of those events which we must be content to accept as a miracle ; the threat of punishment to man, and to all flesh,

wherein was the breath of life was fulfilled, by the outpouring of the wrath of His displeasure, but in the midst of His wrath there was mercy to be found ; He saved one family, and when His anger was appeased, a sweet savour rose unto them, and He said, "I will not again curse the ground any more for man's sake." "While the earth remaineth, seed time and harvest, and cold and heat, and summer and winter, and day and night, shall not cease."

Here we have an example of "earth" as alluding to this entire globe ; the covenant has been kept from that time to this, but before entering on the beautiful region which this merciful promise opens up to us, I must consider for a time the man whom God found worthy of his love, the man who was saved from destruction.

CHAPTER XII.

“ But Noah found Grace in the eyes of the Lord.”

“ NOAH was a just man, and perfect in his generations, and Noah walked with God,” and for these reasons he was saved from the ruin which came upon the earth, and God said in his heart, “ I will not again curse the ground any more for man’s sake.”

The Creator then allowed that he had cursed it; we shall see presently that curses had happened more than once, and that some of them were handed down with men, notwithstanding that they were punished for their sins by almost utter destruction.

The serpent was first cursed, and told—"upon thy belly shalt thou go;" this appears to have been an inevitable result of the physical form of the reptile, but it was a curse, inasmuch, as while everything was to go on improving, the serpent alone was to remain as he then was all the days of his life, or for ever. Unto Adam He said, "Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life;" "Thorns also and thistles shall it bring forth to thee." "In the sweat of thy face shalt thou eat bread." Like the curse to the serpents, these curses appear to us inevitable, and very ordinary results; but as we do not know the condition of the earth at that time, and are ignorant of the joys born with man, and shared in by woman previous to the sin which brought these curses upon us, we can only accept them as the results of a grievous offence, and feel that even the expiation of the flood removed no tittle of the curses; we still eat bread in the sweat of the face, the earth still produces thorns and

thistles, and many partake of the fruits of the earth with sorrow.

As I have shewn, at the end of the last chapter, these curses were modified after the ruin of the flood, the ground was to be cursed no more for man's sake, and a covenant was made by God. "The waters shall no more become a flood to destroy all flesh." Let us consider why and for whose sake this covenant was made. God in His eternal dominion loved justice, and in the midst of the crowd of the wicked, He found one just man, upright in his generation. He saved him, and He gave him a covenant, which has remained unbroken for 4,216 years.

The man with whom this covenant was made was named Noah; from him our language to the present day retains the word nautical, we find it in use with other nations, and a ship in India is called a Nau, still.

I will think for a short space on this long use of one word. Did the old ship give its name to

Noah, or did he give it to the ship? Was he a shipwrecked mariner, lost upon the mountains of Ararat? was he handed down in poesy, and saved as the one good man spared from the wreck of nature?

Such fables are common to humanity at the present day. There is a Jonas in every ship, and all misfortunes are ascribed to him; a special providence watches over one, and the demon of destruction takes off another. Superstition still envelopes us, some of us frequently invoke the aid of God, or the devil, in our anger and our haste, to help our friends, or destroy our enemies; we forget the justice of that Supreme Judge, "who sees with equal eye, as God of all, a hero perish, or a sparrow fall."

By this God, Noah was ordered to build an ark; the instructions as to size were beautifully specific; but no one in these days, unaccustomed to ship building, could put together a vessel capable of enduring such storms as the ark en-

countered; our educated people could not do it, the untaught inhabitants of Africa, or Australia, could not build it.

I assume, therefore, that ships were well known before those days, and that the Nau, a ship which carried the Nau Wallah (sailor), was a ship stranded on Mount Ararat, in some great storm and deluge. These deluges seem to have been of frequent occurrence—they are handed down to us in legends, and floods are frequently mentioned in the Old and New Testaments. Man regarded nature in those days, he had no instruments to guide him, and we may suppose that the man called Noah possessed in a remarkable degree the gift of a knowledge of the weather, and the prudence to act on his foreknowledge. To this he was indebted for his salvation, and, as frequently happened in those days, this salvation was attributed to the direct intervention of God.

It is natural to suppose that the art of ship building had advanced considerably before Noah could have put together so large a vessel as the

ark is said to have been—the instruments and implements to build it with would not have been forthcoming, unless they had been previously in use. Saws were required to divide the wood, adzes to hew it, and planes to fit it. Without these and other appliances it is difficult to suppose that an unskilled person could have built a large ship, strong enough to withstand the raging of a deluge that broke up the very foundations of the deep. I come, then, to the conclusion that ships were common things before the flood, that their name was similar to the present Oriental word, *Nau*, and that Noah was the famous *Nau Wallah*, who, in the midst of a great and terrible destruction, saved himself and his family by, as the Duke of Argyle expresses it, “knowing how to do it.”

I detract nothing from God’s mercy by this interpretation—the gifts of forethought and precaution are amongst the most valuable talents entrusted to our care; and in saying that Noah made the best use of them—I illustrate the

capability of man's dominion upon earth—I exhibit the use of those faculties which we all possess, and I allow the infinite mercy of the Creator, not only for the gift itself, but for the faculty of making use of that gift.

The legend of this great escape was handed down, till the subject coming under the consideration of the inspired writer, he properly and naturally attributed the salvation to the direct interposition of God. The language of the escape, though full and explicit, yet leaves some blanks, which, without a better knowledge of the habits and customs of the times, are difficult to fill up. I look, therefore, upon its beautiful history as one told us by those whose habits and customs led them to give God the credit for His direct acts of mercy and judgment, and to give no credit to man for genius or science. If the deed performed by Noah had been done by any modern mortal the name of the Creator would scarcely have been united with the man. We glorify the name of Shakespear, because he had the gift of describing

in exquisite language the follies or the virtues of mankind. We glorify Newton, because he had the gift of thought, and the capability of putting those thoughts in order. We do not say that God interposed specially to aid these men; the olden writers would have given all the glory to the Creator. We honour our great Duke, because he was successful in war; the ancients would have made the sun stand still to give him light for his victory, or he would have fallen under the mystical rule of Siva the Destroyer, according to the theologies of the East. Napoleon, Alexander the Great, Cæsar, Cyrus, with hundreds of others, are all glorified by name, and that of the Creator is not associated with them; but their deeds were as much from a direct interposition of Providence as the escape of Noah from the flood; each man had a work to do, he was gifted by his Maker with power and genius to do it. Some have been designed as destroyers, some as preservers, some instructors, and some to chronicle small beer; some find grace in the eyes of the

Lord, and pass their lives in doing good according to their gifts, and the inspired writer tells us that Noah was a just man, perfect in his generations, and walked with God. In these words we have the whole history of the transaction; honesty to our neighbours, confidence in God, and a freedom of execution in that which is right, will enable us also to find that grace in the eyes of the Lord which Noah did.

CHAPTER XIII.

“ While the earth remaineth,
Seed time and harvest,
And cold and winter,
And summer and heat,
And day and night,
Shall not cease.”

SOME four thousand two hundred and sixteen years ago, according to the chronology given in Hayden's Dictionary of Dates, a covenant was given to man by God in the above words. This covenant has been kept up to this time. The sun has been said to stand still, one of those figurative expressions so frequent in Scripture when the hand of God was supposed to favour man; but

as far as we know, there has been no alteration in the laws laid down in this covenant.

It was to this regular succession of seasons that the sons of Noah were introduced, the order of nature was to flow on in a beautiful circle of everlasting changes, each change bringing its rest and its labour, its pleasure and its pain, its gathering and its scattering.

A "reign of law" was wanted to bring back the earth to order, a simple and a regular rotation was given—the law was fixed and immutable. Everything fell under that law, but the variety of issues to that law are still beginning, and never ending. Let us endeavour to look upon the effects of regularity acting upon a long season of irregularities, and follow up some of the changes which these laws of nature brought about. I consider everything that happens in nature as superhuman, but I hold to nothing as a miracle. By this I mean that though it may be beyond our comprehension, yet that whatever may be outside of that is yet within the compass of the law, and

that it is only our ignorance of the law which induces us to use the word miracle. If, then, that is a miracle which we do not comprehend, why is not that also a miracle which we do? for both issue from the same law of nature.

Thought and scientific reasoning have explained many things as inevitable, which our forefathers considered as miracles. Our Hygien principles tell us that the plagues of Egypt were the natural results of the laws of nature. Yet the Israelites and Egyptians considered them as miracles, and many of the present generation will still assert that this opinion was correct. I will admit it to be so only on the understanding that every natural event, such as the growth of a fungus on an oak tree, is a miracle, though it is as much an issue of the law as the plague, the cholera, or any other visitation which that law brings upon us. It is the very fact of our not comprehending the laws of nature, and our consequent neglect of providing for or against them, which leads us into miracles, and then we escape by saying “ *Who would have*

*thought it?"** If Noah had said this his sons would not have now been stepping out of the ark upon the earth.

It was all before them, the wide, desolate, inhospitable earth. It had been many thousands of feet below water. The dove had brought back an olive leaf in her bill, so that nature was not entirely destroyed ; the raven had not come back to the ark, so that there was food for her. Yes, food in plenty for the carrion birds, and the scavenger beasts. Animals, and birds, and man had, as their powers enabled them, sought the uplands, when the raging flood drove them from below. Reptiles and insects, crushed and broken, had been washed and heaped upon the crags of Ararat by the winds, or the same currents that washed the ark to that destination ; the rough places had been made smooth, and the hollows had been filled up by masses of strange and incongruous

* Since writing this section I find that similar thoughts are expressed more fully, and to a greater depth in "The Reign of Law," by the Duke of Argyle. I had written *rule* of law in my rough note, but have taken the liberty of using *reign*, a plagiarism I hope to be pardoned for.

materials; there had been haste and fury in the terrible visitation, the waters had found scant time to separate or classify—slimy and full of matter was that mountain side, and as the sun came out again in his splendour to shine upon the destruction around, life of all sorts sprung up from the soil, from the rotting organisms and the bubbling mud. Grass, herb and fruit, thistles and thorns, sprung spontaneously from the soil, and in a short time the surface evidences of a flood had disappeared.

There was plenty of food for man, the herb sprung up in its luxuriance, upon hill, on the plain, or in the vale; no culture was then needed. Unknown food was placed before him, "Every moving thing that liveth shall be meat for you," and he increased and multiplied.

We are told that in the days of Peleg, or in the second century after the flood, "was the earth divided." Here is an example of earth as meaning only a portion of this world, "And the whole earth was of one language." I presume

from what followed, that this whole earth included only that where the descendants of Noah lived, and where they said, "Let us build us a city and tower, whose top may reach unto heaven," and from whence they were "scattered abroad upon the face of the whole earth." During this exciting time, everything but the building had been forgotten, but the reign of law was not.

One inevitable result followed this great assembly of men. There was no food for them, and they separated; each head of a family went his way, never to return to Babel. There was another issue to the inevitable law, as they removed from one another, and found new scenes, new abodes, and new subjects; fresh ideas entered into their imaginations, and new words were coined by each tribe to express these varied ideas, till, in time, the language of their forefathers, once the language "of the whole earth" was forgotten, and as many languages sprung into existence as there were places to occupy or

tribes to speak them. I shall be found fault with, by those who adhere to the miraculous, for saying that this confounding of languages and scattering abroad was not a miracle in the ordinary acceptation of the word; but it was, nevertheless, a superhuman event, brought about by the law of nature which God had ordained. It was an unavoidable result, induced by mortals, in consequence of their neglect of the seed time and the harvest.

Now, we may look back, and understand the curse upon the serpent. There was no improvement for him; how would it have fared with man, if there had been none for him? There were new regions for him to inhabit, with excess of cold and excess of heat. There were inevitable changes under each dispensation. There were clothes to invent, dwellings to build, and thoughts to be exercised, to meet the changes which they themselves were seeking. Time and experience taught men that which was most conducive to their comfort in all regions. The native

of the tropics covered himself with light cotton, or with nothing; the inhabitant of the Polar seas dressed himself in thick furs; the one eat blubber, the other vegetables; but we, despising the experience of these nations, go amongst them, eating our own foods, using our own clothes, and attribute to the climates the inevitable results of the laws of nature which we ourselves infringe.

This law of nature, the "great parable" as the Duke of Argyle calls it, requires then to be understood in the minutest point. Everything has an object. Nothing is too small to notice. Man cannot see the links which unite causes to effects; he must look to the infinite varieties of summer and winter, and endeavour to comprehend the endless changes which each variety produces; he has something more to do than the bee or the ant, to enable him to fulfil the duties which God requires of him, the proper fulfilment of which is as necessary to himself and his offspring as its grain heap to the ant or its honey store to the bee.

Through every season, even down to day and night, there are changes and varieties interminable, no two days together are alike, no two nights; the cold of the one is greater than the other; the heat of one is in excess of the other; there is drought and moisture, darkness and light, cloud and sunshine, dew and rain, hail, snow, and frost, hot, dry winds, and genial moist breezes; in every few miles of distance there is a variety of day and night, and every variety produces its changes of life: every change goes on in an endless chain of links; it is hopeless the endeavour to understand them all, but it is right and fitting to do all we can to comprehend the vast system over which man has the dominion; a dominion that "shall not cease while the earth remaineth;" but a dominion which cannot alter one of nature's laws. The attempt to reach the heavens brought about the very thing that the sons of Noah endeavoured to avoid, and they were scattered over the *whole* earth, to learn, and understand that the laws of nature are

immutable, and that there is no escape from them; and further, man may learn to comprehend that there is good in everything, that there is a grand whole to be thought of, and that details of all sorts are as necessary to that whole, as the token of His covenant is a consequence of the sunshine and rain.

CHAPTER XIV.

"I do set my bow in the clouds."

HERE was the token of the covenant that the world of this earth was to be drowned no more: a sign in the heavens of sunshine after storm—one that we may suppose did not exist in the murky years which foretold the flood to Noah, and one that, if it ever had existed before, was forgotten, so far as to be hailed with delight and wonder when it reappeared to the few survivors of the Deluge.

Like the name of Noah, this radiance has been handed down to us, for we all look on the rainbow with pleasure; still recognise in it the token

of God's good will, and apply it in our rhymes as a warning or a delight.

This token is so intimately connected with the last chapter, its origin is so blended with the summer and winter, with seed time and harvest, that I have gone back to it, with the intention of fusing the subject into its mass, with no perceptible junction—an idea gathered from the blending of the colours in the bow. How distinct each colour is; yet look at the joining—the most careful eye cannot see where they meet. The harmony is perfect—as all in nature is. There is no beginning and no ending, for all the colours link together, and all cling to one another with a joyous and exultant harmony. Thus the rainbow tells us there was rain, that it fell in showers from the passing cloud; that the great heavy canopy of moisture, which had for so long a time hung suspended over the earth, as the sword over its victim, had departed; it tells us that the cloud had passed away in reality—and allegorically—and that the sun was again shining and

warming the earth ; that there was a seed time come. This seed time had been used, and had been neglected. But the rain, what was that doing ? it was watering the ground, and helping to produce, not only the harvest, for which man had not sown, but an alteration on the face of the earth, imperceptible as the junction of colours in the rainbow. But as sure as it is that the colours looked on by Noah with veneration are the same colours which we find over our heads to the present time, so sure is it that both rainbow and alteration have kept pace together, and that both are dependant on the rain and the sunshine. That glorious light, which many of the present inhabitants of the earth look to as we look to our God, had shone out and had dried the earth. There was dust on its surface, light and pungent. The soft matter which had been left over its entire face by the subsidence of the waters, a light alluvial soil, clothing everything except in those places from which the retiring deluge had swept it on its abashed retreat. On mountain

top and level plain the sediment lay, thick and light. The wind gathered it on its whirling wings, and the showers laid the dust, as they do to this day. Yes, the dust was turned to mud as summer showers fell, and it trickled down with the little rills these gentle showers made. And the little rills scooped out little hollows, and the little hollows ran imperceptibly into little vales, and the little vales joined the large water-channels. Each in its turn deposited the earth's dust, its refuse surface matter, on the banks, in the hollows, upon the flats of rivers, or even down into the hungry sea. Then, when the summer time was over, and the rainy season came on—or the winter with its frost and its snow—there was still some dust to wash away, some rills to enlarge, some valleys to raise higher with deposit, some to make deeper, some portions of the great water courses to fill up, and some to wear away. But there was still refuse, dust and mud, vegetable remains, organic matter, everything, in fact, that could be, or might be collected from

the earth's surface, to float, or to be washed away to the lake, or ocean, as the case might be.

The heat of the sun and the cold of the frost, each worked to one end in their varied but harmonious systems,—so graduated in the tropics that the difference is scarcely perceptible, though the seed time and harvest are; so blended in the temperate zones by the intervals of autumn and of spring, that the change is scarcely felt. In the frigid zones there is an arrangement of nature so fine and so exquisite, that we scarcely even recognise its system, though we hear of the effects. There, summer and winter run into one another with a quickness and a determination that is at once evident and remarkable. But while the external aspect has, for long, dark, and cold months been stern and forbidding, a covering has been provided for the earth, as it is for man, and underneath its warmth, the surface has been gradually preparing for its seed time. The first section of the living sun has looked up to fulfil His promise, and in a brief period, even

these inhospitable regions find a continued day and a certain harvest.

The never-failing summer has come; the snows and the frosts are gone; the shattered rocks roll down beneath the melting snow; the great icebergs loosen their frozen anchors, and float away to distant seas with rock and boulder laden; the impetuous torrents rush down in bubbling foam, working out new channels, or filling up old ones, and carry with them strange mixtures to their different destinations. Some of these are destined to form the hard rock; some the sand bank, and some the shingle shore, to be again deserted by the retiring wave, and to be again worn down by the rush of melting snow.

This system has been going on ever since the earth, in any portion of the globe, grew high from out the water. Warm rain or cold, melting ice or snow, all work to one end. The retiring of the sea and the growing of the earth are so intimately blended, that I cannot but wonder at

the different views I find expressed upon the subject.

I will cull a sample of this difference from "Rain and Rivers," by Colonel Greenwood, who, in combating a theory regarding the Mississippi, as given by Mr. Ellet, says, p. 227-8 :—" *When the Mississippi first began to cut its channel to the sea, which was when the land had just risen from the sea, there was no indenture in the sweep of the gulf, nor did that shore reach up to above Ohio, as Ellet has supposed. On the contrary, the shores of the gulf (I do not allude to the Delta) extended then much further into the sea than they do now, and they have been borne back by the sea.*"

Colonel Greenwood's argument puts me in mind of the dispute over the colours of the chamelion, and though I do not aspire to be an umpire between him and Mr Ellet, I cannot resist applying to this controversy,

"When next you talk of what you view,
Think others see as well as you."

I believe that the system or the theory advocated by each is the same, only the times referred to are different, and the results are consequently affected by those times and seasons.

But neither of these gentlemen have gone far enough in my poor opinion. The shores reached far above Ohio; and though, as Colonel Greenwood says, "they have been borne back by the sea," I will ask him, how they first got there to enable the sea thus to act upon them?

To enable me to answer this, I will ask these gentlemen to step back to the Rocky Mountains, and visit the sources of the Missouri, the Yellow Stone River, the Arkansas, and the Red River. They receive the water shed from about twenty degrees of latitude, and the waves of the great seas received their first contributions of the Rocky Mountain sands when they beat upon the mouths of the little rivulets, which now send their supplies to it through these great rivers into the Mississippi, ere sun or moon were visible to earth.

At the time I go back to, there was no land

visible eastward, from the tops of the Rocky Mountains, but the foundation was laid for the heights about Washington. These hard banks in time—grew out of, and took the place of the sea, and are now called the Cumberland and the Alleghanny Mountains; these also, in time, sent their little trickles into the sea as it met their dancing sprays at the foot of the slopes from which they first issued. These slopes, gradually extending, thrust away the sea by slow and sure degrees, over the soft alluvial shores, and flats, over the hollows, where lakes are now found, over the hard bars where the rapids still exist; over the pebbly bottoms, where pebbles are grinding still; all through those thousands of miles from forty degrees of north latitude, including some twenty degrees of longitude, down to the Gulph of Mexico, as we now find it. I will not say that they did not extend further into the sea, or that they have not been worn back by it, but such is not the principle of nature; though the sea may encroach here

and there, the land grows elsewhere, and if it had not grown as I have described, how could it have got to where Colonel Greenwood places it, so as to enable the sea to work upon it?

Looking at the enormous extent of country washed by this great river, the Mississippi, and imagining the vast quantity of refuse gathered by it, it is easy to see that alluvial plains on each of its tributaries, and on the great river itself, were first formed in the sea as deltas, that soil and herbage grew upon them, and insect with animal life combining, they gradually grew beyond the reach of water, except in great river floods, that as the sea retired, it left its bars of rock, firmly bound together with the adhesive matters of water life, its sand banks, and its mounds, and so ever since the first atom was washed into it from the rocky mountains, the rivers have gradually expelled the ocean from its place. So far it seems to me that Ellet is right when he forms his delta from the wash of the land.

Colonel Greenwood is also right when he says,

(pages 216-17)—“*No one will doubt that the Niagara gorge is cut backwards.*” In almost every river there are rocky obstructions ; in some part of its course, they may be of granite, trap, slate, marble, sandstone, or limestone, every one of them originally placed here by water, and concreted with silex, lime, or other adhesive mixtures of animal life. From the first moment that the river water begins to flow over such a bar, the bar begins to wear away, the rivers perpetually lower their courses in some places and raise them in others, and I feel inclined to say to Ellet and Greenwood—“You all are right, and all are wrong.” All nature goes on in this way ; there is the perpetual distinction and perpetual growth, constant life and constant death ; frequent sunshine and frequent rain ; and while we look at the torrents of the tropics, and the showers of our temperate zones, we know that each in its turn is contributing to the destruction of what was, and the reconstruction of that which is to be, and that every shower and

every sunbeam is only a portion of that great whole which, under the control of one great Power, unites with a consistency and a harmony similar to the colours of the rainbow—that beautiful token of the goodwill of the Creator towards earth and towards man.

CHAPTER XV.

"And the vale of Siddim was full of slime pits; and the Kings of Sodom and Gomorrah fled and fell there; and they that remained fled to the mountain."—GENESIS IX. v. 10.

IN my last two chapters I have endeavoured to paint the exceeding harmony of the laws of the covenant. I will now attempt to shew some of the results of these laws as pointed out in the wonderful history from which I head this page.

Although the sons of Noah are supposed to have stepped out of the ark on the earth from which all life had been washed away, we find that in about four hundred years his descendant Abram was engaged in fighting with his neigh-

bours, who also were contending with one another. I may here remark that this fighting gives good grounds for the supposition that the Deluge was only partial, or that the dates are wrong, for many people would be loath to believe that strange kings had risen in so short a time, and that all were engaged in fighting; that they had, in a few short years, forgotten the mercy shown to their forefathers, and remembered no more their brotherly or neighbourly affection. But when we come to consider the rapid growth of human life in those days, that every head of a party, or village, assumed the name of king, that there were no fixed boundaries, no limits of cultivation, or of pasture, that every man gathered his food or sought his game wherever he could find it, we can understand that the kings were little kings, and that contention was necessarily the rule, and not the exception.

It is of little consequence to my sketch how they fought, who gained the laurels, or who died

the death, but I glean from these incidents that the face of the country then was very similar to what it is at present.

Siddim was by the sea side, and there were slime pits there, and those who escaped from the pits went to the mountains.

We find these slime pits, bogs, morasses, marshes, quagmires, quick sands in every country; wherever they are, there are higher lands in the vicinity, which sometimes assume the name of mountains; on their sides, at their feet, or on the plain below, we find the four first. In rivers, and on the sea shores, we find quick sands. I will take either as synonymous to "slime pits," and draw the conclusion, that the same laws were at work in those days as are at work now; for the convenience of diction I will call the inland slime pits marshes, the sea side and certain river slime pits quicksands.

These latter are found every where; we have some grand examples of them close at home, in

the Goodwin Sands, a mass of quick movable material formerly solid land, but so near the level of the sea that when in the year A.D. 1100 the repair of the sea wall was neglected by the Abbot of St. Augustine, the waters rushed over it, and have kept possession till this day; portions of it are dry and firm at low water, but even as the pits of Siddim swallowed up the kings of old, so have these sands been the cause of destruction to many a strong ship, and to thousands of human lives. There are no sandy sea coasts without some portions of them coming under the title of "*quick*;" they occur accidentally, either in small patches or in movable masses—in both instances they are due to hollows beneath, or to a strata below the sand, which ponds up the water, and keeps the sand so saturated that it cannot settle down, and consequently all sands which are so saturated with water as to be in a floating state fall into the deceptive condition of quicksands. Exactly

the same formation takes place in rivers, and here, if possible, they are more deceptive than on the sea shore; but woe betide the man or beast that becomes engulfed in them; this is a very common occurrence, for these sands, dry and firm when the rivers are low, when the water rises above a certain height and enters the basin, or flows over the edge of the strata on which the sand rests, become traps for the animals which have used them as firm and safe paths for many days.

The inland marsh is frequent in all countries, and is formed much in the same way as quick-sands, by the inability of the water to escape entirely through, or out of the strata, upon which the marshy matter rests. We have large extents of marsh land in England, which supply a vast quantity of good fuel to the inhabitants of the district. Ireland is estimated to contain about three million of marsh and bog acres; here and in Scotland patches of it are found high amongst

the hills, where the soft green moss growing over it forms a tempting spot for the unwary feet; our New Forest is full of swampy places, vegetable growth is coarse on these spots, consisting of rough grasses, reeds, and spongy masses, and it is the refuse of these decaying vegetations that forms the fuel on these marshes, from which the surface only is shaved off to a depth of about two inches in the course of a few years; while those marshes which supply the bog fuel have been filled with their decayed trees, and other vegetable matter, for hundreds of years. These marshes or peat bogs, would in time have given lignite, and if they had been buried deep in the earth would have become coal.

All low countries (with a few exceptions which I will notice presently) contain marshes; in Italy there are large tracts of them noted to this day for their pestilential character. At the mouth of the Loire there are extensive marshes, the fuel from which has been used for many years. The

northern regions of Persia, and the south of Russia have vast marshes, and in the steppes of the Khirgis there are salt marshes, and salt waters. In America are vast tracts of marsh land, particularly plentiful from the northern sources of the Mississippi to the Gulf of Mexico; and in reference to my last chapter, I may here observe, that this marshy land is an evidence that the general run of water has not subsided from these districts for a great number of years. In South America, on the edges of the Pampas, and all along the great rivers, are vast extents of marshes. As a rule marshes have been much abused for their fatal atmospheres; but here again man is to blame, he approaches the unhealthy region for the sake of gain; the soil around the marshes is productive, the peat dug from it gives him an excellent, and a cheap fuel; many thousands of human beings gain their living from excavating, or cutting turf; the bringing home the peat from the Irish bogs, and building their

peat stacks is as much a labour of joy, as our hay making in England ; it is cut and placed to dry, it is then gathered, and then carted, all hands being busy in the work. Human life has many enemies, but most of them are aggravated by our wants, and our own passions.

Malaria, fever, ague, and rheumatism kill their thousands, but the peat and marsh fuels warm their millions. I cannot consent to the abuse which has been showered on the marsh lands, because I look upon them as natural results of the laws of creation ; we cannot expect to find all our soils rich, we calculate on a thorn in the rose bush, and poison in the beautiful snake ; we must take the bitters and the sweets as we find them, and if we wish to look upon the whole creation as beautiful, we should endeavour to find a use in every thing, and try to find a blessing, or a lesson, a port, or a warning beacon, in all that nature presents us with.

We have the same things to deal with upon

the face of the earth, which brought grief on the kings of Sodom and Gomorrah; the slime pits have since those days brought destruction upon hosts of men, and as long as there is any benefit to be derived from them, man will build his cottage by them, the warrior will use them for his defence, and will fall into the midst of them himself. There is one use to which I have known a marsh put, that I have never seen mentioned, yet it is as fitting an instrument of exorcism, as our horseponds were in England only a few years since, when the miserable witches were soused in them; it was sometime in 1851 that three old women took an old man and buried him in a swamp up to his neck—the affair was taken notice of before the evil spirit left the man, and if the old women are now alive they are doubtless still convinced, that had it not been for the stupid interference of others, they would have succeeded in ridding the old man (to say nothing of themselves), of a very evil spirit.

Regarding the exceptions in low countries, noted above, I have found that there are, as every one knows, two sides to a mountain range, an abrupt, and a shelving side; in considering the cause of this I come upon several different effects of one law, and I must go back to Chapter IV.

When the winds and the waves made a bank, one side of this bank was exposed to stronger forces than the other, this side became steeper than the other, even as Leyell's little wind ripples have one steep, and one shelving side. Let us magnify a ripple on the sand into a mountain range upon earth, it will be found that all isolated mountains may have their sides tolerably even; the force of the waves which built them was equal all around, and the denudation has been tolerably equal also; but, in long ranges, one side is invariably more perpendicular than the other.

I will take for my example the mountainous

range which runs from the Decan in India to Cape Comerin, extending over thirteen degrees of latitude; I have shewn in Chapter IV. how these hills were formed; the currents and the winds come strongest from the south west, and the hill face to that direction is therefore the abrupt one. Another result follows this formation; the rain, falling on the mountains, rolls gradually off the eastern side, and has extended the Peninsular breadth to several hundred miles in a gradual slope, with great rivers perpetually running through the extensive plains. The rain, which falls on the western side, runs off rapidly; the consequence is, that the trap rock is completely denuded in many parts, deep ravines are formed, impetuous torrents rush to the ocean, over a short course of some twenty miles, and the whole soil of this district is completely different from that on the other side. Above, it runs into rich valleys, and large alluvial plains, but on the western side the soil appears to be nothing but

decomposed rock, of a light colour, capable of little more than producing rice in the rainy season, growing in narrow valleys, covered by rough abrupt hills of denuded rock. On these low hills and in these valleys I never found a bit of marsh land, except on the borders of natural or artificial lakes, and even in these they could not be called swamps, or slime pits, as their bottoms are firm in a few inches. The sands formed in the river courses from this region are generally firm, and soon settle down.

There is another result worth noticing here; the mountain gorges are more worn away on the steep side than they are on the sloping side, and as the journey to the sea is short, the contributions from these hard rocks soon reach that destination. All these gorges, as Colonel Greenwood tells us, wear backwards. Any one who has threaded the intricacies of a mountain gorge must have marked the gradual wear and tear of the torrents that laboured at it, and I would draw

the attention of those who have not been in these localities, to the graphic pictures of Abyssinian mountain scenery, given to the public by the "Illustrated News," from the pencils of officers engaged in the late expedition.

These gorges, or ravines, are already worn far back into the bosom of the mountains, and will, in time, erode them through. A similar result is shown in the washings from the western face of the Indian, and from the eastern face of the Abyssinian mountains; in the latter the country below is sandy, and without water; in the former the country generally is sterile and waterless.

I gather from all this, that the slime pits were quick sands, and not marshes, that the kings fought on the steep side of the mountains by the sea-side, and that the wash of matter from the mountains was of a substance similar to what it is now. The sediment was still partly from matter deposited by the flood, and bore perhaps more the character of slime than it does now; but all these

marshes may vary in character, depending not only the substances which form them, but on the condition of those substances; some are pounded up and decomposed before they reach the marsh; some have grown upon, and have rotted on the marsh. The same holds good with quick sands; some sands are heavy and settle down, and some are more light and pervious to water.

Thus it is, that though the law which forms these quick sands and marshes never changes, but has been ever since the flood, till now, perpetually at work on these materials; yet, with every material there is a different result, but one thing is sure, that marshes abound more on the sloping side of the mountains than on the steep side. Quicksands in river courses abound only in the long slope of country. Sea quicksands are found on either side, but I believe they are more extensive and more subtle on the sloping side than on the abrupt side of the mountains.

The forces which formed these different results

are still at work, the winds still blow upon, and the currents of the ocean still wash upon the western coasts of India, with a force and a fury similar to that which built the mountain range I allude to from the water sediments.

No thinking person will look upon a mountain range without perceiving these effects of the law of nature, and every one who perceives this will recognise and acknowledge the regularity, the constancy, and the beauty of these laws, and be prepared to admit that the results of these laws may vary with every material upon which they have to work, as well as with the uncounted variety of condition in which the myriads of materials may be found.

CHAPTER XVI.

"And he dwelt in a cave, he and his two daughters."—Genesis, 19, v. 30.

Not very long after the accident to the kings, recorded in my last heading, the city of Sodom was destroyed, and as Noah was preserved in the deluge, so Lot was delivered from the fire. As Noah was forewarned of the curse which was to overwhelm the earth, so Abram was informed of the intended destruction of the cities, these very cities, the kings of which had fallen into the slime pits of Siddim.

The Holy Scripture again ascribes the escape of

Lot to the direct interference of the Creator ; but as there are forewarnings of coming events now, we may suppose there were forewarnings even in those days, and that Abram and Lot (brothers) were gifted with a knowledge of these signs of danger. This gift was no less a proof of God's presence, and of His mercy towards His chosen people, than if actual messengers spoke the warning, but as I have already said, it was the habit to ascribe everything out of the common way to God's direct interposition ; it enhanced the character of the person thus ostensibly protected, and went far in procuring him the reverence of the surrounding world. God then consulted with Abram as to the destruction of the cities, and we may suppose, without throwing any discredit on the Bible history, that he communicated the intelligence to Lot, who believed what was told him. He endeavoured to persuade his sons-in-law, but they, not being gifted as Lot was, " he seemed as one that mocked."

There was no time to be lost, the day of destruction had come, and even then Lot clung to the vanities of life, and hesitated to go with those who were sent to fetch him, till they "*laid hold upon his hand*" (an oriental metaphor for compulsion to this day); there is another beautiful metaphor in the conversion of his wife into a pillar of salt, as she looked back on the vanities they had left, and Lot with his two daughters escaped, and went up out of Zoar and dwelt in a mountain *in a cave*.

There were caves then in these early days after the flood, and we hear of them frequently in the Scriptures; they were in the mountains, and high up, they are there to this day, and prove, if proof were wanting, that the hills where they are must have been formed by water deposits. Caves are in all such hills; we find them in the British Islands in plenty, in the Hartz mountains they are frequent, as they are in all limestone rocks. In India the hills are full of them, but these

hills have been said to be formed from upheavals of molten matter. I refuse to accept this theory, and believe that they are nothing more or less than a fine deposit formed in the sea, a gradual collection of many ages ; they are in steps and broad layers : the season of roughness (like the present season called the monsoon) depositing the greatest quantity, while the fine season continued the deposit, but in a milder form, so mild indeed that at times these deposits assumed a different character, and, as I have said in Chapter VIII., filaments of lime came between the main deposits of two seasons. These changes in the quantity of deposit account for the rocks exhibiting on their broken faces the irregular thickness of layers, exactly similar to the layers in our chalk formations, though not distinguished by any foreign substance such as flint.

If these terraced hills had been produced, as some say, by fire, and by molten matter issuing from the centre of the earth, how could the in-

tegrity of these terraces have been preserved? the eruption must have risen, and its force must have been very even over hundreds of miles of country, to enable it to erect the mountain masses which we find. The material must have come up in a liquid state, and year by year, or age by age, it must have heaved up the tablets of the previous years with mathematical precision, or something must have happened to reduce the volcanic confusion into the straight lines in which we now find them. Accepting for a moment, and for the sake of argument, that trap rocks and limestone rocks have been formed from molten matter pressed upwards by subterranean forces, how can we account for the caves? Such masses of matter working their way up would come in jets, and forcing up the stratas above them, would naturally find some weak points upon which to form uneven strata. Now, supposing that in this uneven mass a hollow place was accidentally left which the liquid molten mass refused to fill, how

could that hollow place shut up in the middle hill be filled with bones and perishable materials, over which no symptoms of fire or heat are visible? It has been allowed by geologists that these caves had two holes; these could not have been made by any matter in a state of cooling, unless there had been a nucleus to form them upon, but these two holes disprove the whole theory of fire, and confirm at once the truth of the water system as to the formation of hills in which we find the natural caves.

It was probably to one of these that Lot retired: they are found in all hill districts with which I am acquainted, and the scarped rocks of such hills tell the history of the water action upon them, as plainly as our island cliffs tell us that they have been cut away from sloping Downs.

Whenever I see a scarp, precipice, or cliff in the natural side of a hill or country, I know at once that these were not always there, but that the

wear of water and of weather has carried off the slope, the incline of which was of the same character as that still left upon the hill top, and taking it completely away, has left the scarped face to tell us of what the hill is formed. Man has a natural curiosity to find out things, and a cave is a place to be soon discovered.

In cutting away the face of the hill, the water naturally washed into faults, or crevices, and the accumulation of water in such places frequently hastened the separation of the hill. We hear of land slips frequently; some such cause as I have hinted at produces them. In the slipping, or in the gradual cutting away by the slow, unseen erosion of rain, wave, and wind, the entrances to caves are exposed to man's curiosity. In olden times these caves were used as habitations, as we read in my heading, as sepulchres to bury the dead out of sight, as "*intreat for me to Ephron the son of Zear, that he may give me the cave of Macphelah;*" as places of concealment, "*and he*

hid them by fifties in a cave ;" as places of worship, as may be seen to this day in India.

Many caves of this description that I have seen are situated on the scarps or sides of hills, where, in all probability, a hollow being exposed by the action of water, it was increased in size by wild beasts, and eventually excavated into the temple shape by man.

The caves of Ellora, Elephanta, and Adjunta, are names familiar to all. They are formed in the solid rock, the bottom of the entrance resting on the foot of the layer of the deposit ; or in other words, are excavated upwards from the bottom of a layer. In examining the walls and pillars of these caves, I found cracks and lines indicating different periods of the settling down of the mud which formed these rocks ; there was no vitrification, no signs of fire or of heat, the chisel had done its work on a compact mass of rock, indurated by a vast pressure of material, and by a settling of countless years.

In some of the hills I allude to there are no less than four ranges of caves in four succeeding scarps. All of these caves have been used by man ; the upper ones are rough and rude, some of them retaining their natural shapes ; as we descend the caves improve, till we reach an age of exquisite architecture and elaborate finish.

Now each of these series of caves represent the gradual falling away of water ; the scarps in which they are situated tell us of the gradual wear or erosion caused by water, and the sloping, rough face of the hill between these scarps, tells us of a falling down from, and a yielding of, the face of the rock for unknown time, but in a regular succession of ages in which the same agencies have been at work. Thus a hill with three scarps represents three ages of denudation ; as the water retired from the soft side of the hill, the action of wind and moisture from above affected the broken frontage till it split off or exfoliated, leaving its *débris* at its foot in the water. This *débris* pro-

tacted for a while the face of the hill, till the gradual decomposition or washing away of this fallen material again exposed the lower soft face of the hill to the same action as before, and again the falling material naturally expelled the water from this scene of contest, leaving the scarped mountain the victor, but with a portion of its refuse gone to fill up the adjacent hollow places.

In each of these scarps there are hills and caves, some of them high up in the rocky wall, with no approach to them now practicable to man ; some of these may be seen in the face of the scarp of the Matheran Hill near Bombay,* the holes are about a hundred feet from the top of the cliff, which is some four hundred feet in height. These holes were at one time far within the bosom of the hill ; they were formed as I have previously described, but their contents and a portion of

* This mountain, a solitary mass of basalt, or trap rock, was first explored and brought to the notice of the Government of Bombay by the author in 1851, since which time it has become a sanitarium for Bombay, and is thickly occupied.

their walls have been again converted into building use by the waves ; portions of their materials may even now rest in the mass of broken matter at the foot of the precipice, some may be in use for the growing rice in the fields below, may be forming the sand beds of the little water courses, or the greater river, and some may have gone out to sea to be again deposited as a sifted, sorted, rearranged material.

Every scarp tells its own tale, and every cave may have a different one. Their contents are gone, carried off by the wave, and these contents may have varied in every hollow place ; we cannot tell what perishable substances may sink as the water rolls along. It is perpetually moving its ever varied loads—a current may lodge one material, one tide one substance, the next another, the winds may bring something, the sunshine and frost may each give their contributions, the groundswell may send some matter, the great sea wave, or the natural oscillation of the waters, so

little understood up to this present time, may give its varied loads, accident may contribute some, but the great destroyers, death and time, supply the largest quantities, and the greatest variety of material. There is no living creature in water or on earth that does not contribute its share to the edifice. There is no grass, or herb, or tree that does not send its share. One quantity may lodge in one place and one in another, and wherever any indestructible matter, foreign to the general subsidence of the ocean, happened to settle down, there it formed the nucleus of a fault, hill, or cave; some of these substances have been preserved, and tell a plain tale, to those who will understand them; to those who will not, who reason from the little things which happen before their eyes, without enquiring into the grand, the magnificent process of the architecture of this globe, these caves and holes in our cliffs have become stumbling blocks and sources of endless errors.

Natural causes frequently open out these hills to the curiosity of man, the earth is perpetually wearing away beneath his feet, his footsteps become rivulets, the rivulets become rivers, the winds carry off the surface dusts, and the rains wash off the surface refuse; any one of these causes may expose the cavities which exist underground. The waves of the sea have done great things for us, and have cut off vast sections of our mountain caves, some coasts are full of them. Man, for his ever increasing wants, has done as much; but he misreads his page of nature, he finds a cave in the limestone rock, and he calls it an excavation; he tells us that the hyena filled this excavation with bones; for many years he has been content with this imbecile explanation, one author has followed another, and the world, as is usual, confides in its multiple of learning without thinking for itself. If it considered that the superincumbent mass of (now) rock was at one time in a

liquid state, it would comprehend that the beautiful arched roof could not have been formed without a support; there were when man first found the cave no holes sufficiently large for this support to have escaped by. In the floor of the cavity he finds earth, and loam, and bones in vast quantities, of wondrous size. In the simplicity of his heart he tells us that the hyena placed these bones there. Let man look back and see the raging flood, loaded with swollen carcasses, whirling round and round in the gurgling whirlpool, and sucked down by the insatiable waters to their resting places, he will see in these the neuclei of some of his caves, and he will, if he can reason calmly, throwing aside all previous learning on the subject, all knowledge gained from our best and most complete geologists, or natural historians, comprehend that the floorings of these caves were once the neuclei of them, that they were arched upon these water borne heaps, and assumed their shape above them. Again, man digs out his coal from the

bosom of the earth, this coal was hidden by the water long ago, demand requires a supply, and gives inducement to examination. We have become so skilful in some things that coal is known to exist at great depths, even before it is found—the strata come so regularly and evenly. The same may be said of our metal mines, our stone quarries, and our lime pits; as we dig these varied strata the workmen come to faults, or masses of foreign matter concealed in the great deposit; all these are placed there as I have described above, and in many instances man knows what these faults are composed of. In many he only calls it a fault, and passes through it without thinking of its history, without recognizing in that crumbling grey matter a substance that might have been once in life, and without acknowledging that this substance aided in the formation of this earth. He is eager to get through it to reach his valued vein beyond, and seldom thinks of the other materials he is

working out. It was in one of these faults, hollowed out by water upon the scarped cliff of some high hill near Sodom, that Lot found refuge. The faults or cavities were used as early habitations by man ; there are many of them opened out to view, and these old caves tell not only the history of their fabrication but also that of their partial destruction, and they mark eras in creation.

In the faults of the upper scarps of the mountains of the East the art of man cannot now be recognised ; either they were exposed to view since man descended from that level, or man *was not*, when they were first exposed ; in every successive scarp the science of man is seen to improve. He was, perhaps, at first content with a simple hole to dwell in, then he made a roughly hewn home for his divinity to reside in ; as skill, and time, and wealth increased he exercised all the faculties of a wondrous science to improve upon and adorn these caves, which under their religious and fanciful impulses assumed the most

beautiful, the most fantastic, and the most grotesque appearances.

Into whatever shapes man converted caves and natural holes in the cliffs or mountain sides they tell how the inhabitants of the earth increased, how the various supplies for man's consumption grew in proportion, and how the natural result followed that man was able to devote his time and his ability to the laborious task of planning and hewing out from the solid rock, so hard that it turns the edges of modern English miner's tools, the cave temples, which are still the ornaments and the wonders of western India.

Then these cave temples tell us in unmistakeable language that these cavities were first made in the manner previously described, that they remained buried and concealed with all their treasures, all their contents, till man in his wants, his religion, or his curiosity detected them, and plundered them, leaving the bare walls, roofs, and floors as we find them ; or if man was not the first

to plunder them, the wash of the rivers or the scratching of the beasts may have done so, and man was glad to find such useful assistants. The wild beasts have resumed the occupation of many of these caverns, the sea has retired far away, the rivers have left them high and dry, but these still rush down from the mountain side in their foam, and their spray, and working with a will as they have always done, still continue to expose to view the little faults, the broken crevices—hints to those who find them, be they beasts or be they man, that foreign matters have here found resting places, from the wreck of nature midst the settling mud, which was building up this world of ours.

CHAPTER XVII.

"Pharaoh dreamed; and behold he stood by the river."

My main object in this chapter is to illustrate the working of our river systems, but as I cannot get to this part of my argument without mentioning the names of Joseph and of Moses, I take the opportunity of bringing them forward as illustrations of the stewardship alluded to in my first chapter, as bright examples of the effects produced by a right understanding of nature, and as illustrious copies to those who aspire to exercise rightly that dominion entrusted to mortals by God.

It is now (in the year 1868) some three thousand five hundred and eighty-three years since Joseph interpreted the dream of the King of Egypt. In this instance the coming events were foreshadowed to the man who ruled ; but neither he nor his magicians understood the suggestions of the dream. An accidental celebrity introduced Joseph to the Sovereign, and on being asked to interpret, he at once said with that modesty which is the accompaniment of true knowledge, "*It is not in me: God shall give Pharaoh an answer of peace.*" And then, without assuming any skill of his own, he courteously referred the actual gift to the king, by saying, "*God hath shewed Pharaoh what He is about to do.*" This language, and the verification of Joseph's interpretation by the seven years of plenty gave him such authority, that when the famine came, "*Pharaoh said unto all the Egyptians, Go unto Joseph ; what he saith to you do.*"

That wonderful gift, a knowledge of the change-

of seasons, was never more beautifully exemplified; but this was not the only talent confided to Joseph, he knew how to provide against the consequences of these changes, and this varied wisdom at once gave him authority and dominion over all around him. We further learn from his history with what honesty and rectitude this dominion was exercised.

Pharaoh's dream betrays a mental anxiety about his supplies, and the history leads us to suppose that the inhabitants of Egypt were then, as they now are, dependant on the yearly overflow of the Nile; that great river to which the eyes of Egypt are even now directed (June), as they were so long ago. For upwards of three thousand years, and probably for uncounted years beyond that time, this phenomenon of nature has been going on; the plains of Egypt have been supplied with fresh sediment yearly, there have been exceptional deficiencies, and exceptional excesses. In all that vast amount of time these

plains have not grown above the flood, which flows over them now with as much certainty and regularity as it did in days of yore. Year by year, for uncounted ages, these regions have had their seed times and their harvests; the deposits are left upon the surface, and they nourish the food for man and beast. Year by year the substrata settle down with the growing weight upon them; then as the waters drain off and the rich crops ripen and are carried away, the warm sun shines upon the cracking soil, the hot winds blow, and the whirlwinds lick up the dust, which obscures the light of the mid-day sun, even as that light was obscured in those distant days, when "*The Lord said unto Moses, stretch out thine hand toward heaven, that there may be darkness over the land of Egypt, even darkness which may be felt.*"

These dust storms are frequent to this day; I need only refer to the letters which have been published from the Abyssinian expedition to prove this.

The interpretation of the dream by Joseph seems to us marvellous, but in those times, and even in these, orientals are fond of such things, and a wonderful aptitude and skill is even now displayed in their explanations; but the above quotation refers to events, which coming in their natural courses* were exaggerations of the usual seasons, and, being foreseen by Moses, were used by him and Aaron as weapons to work upon the credulity and fears of the Egyptians. I have before said, that nature was a great study in olden times, and this study appears to have acquired much knowledge—the records of the Chaldeans prove this—but there is nowhere a more clear example of its skill than that given to us in the Bible in the account of the plagues of Egypt. The rulers of that land had, in all probability, become slothful, trusting all to the Israelites, and these men with ready wit and a

* "For a miracle, in its very notion, is relative to a course of nature."—BUTLER'S ANALYST.

deep knowledge of nature, rendered more acute by their impatience of slavery, and a desire to escape from it, attributed to the direct influence of God these plagues which were occurring under the ordinary laws of nature.

The river was turned into blood. There is a similar circumstance that happens to rivers in India; the pools become of a blood red colour, increasing in the intensity of its redness day by day, till the whole water is full of life, a minute wriggling worm, rendering the water useless. Was this the plague of the river, when it stank, and the people could not drink of its waters? Then the waters brought forth frogs. In certain seasons the rivers of the East do so still in alarming numbers, but their numerous enemies prevent the catastrophe which happened in Egypt, where the frogs died, and "the land stank."

Then the dust brought forth lice and flies; the dust was full of decomposed animal matter; what more fitting nursery for these insects in a climate

which to this day is notorious for them? Then came the murrain on the cattle, with boils or ulcers on man and beast; and after these the pestilence. Nature had prepared for these visitations in direct order, and with an inevitable law. All food and drink was vitiated; the very air was poisoned. Ulcers, fever, cholera, and the plague all come from these causes still. Then came the thunder and the hail; these storms generally follow any lengthened continuance of sultry or unwholesome atmosphere. Wherever electricity—that subtle agent, that matter without which there is no life—is scanty, there falls the thunder storm to replenish it. Seasons of sickness, seasons of heat, seasons of any extraordinary events, finish with these electric visits, and the atmosphere is restored to its usual state.

A few weeks since, severe thunderstorms occurred in London and at Birmingham; in both of these places the heat of the season had been exceptionally great; both places were thickly

peopled, and electricity was required. In the Oxfordshire hills, where I now reside, the population is scanty, and the air is pure; these storms did not visit us.

Immediately after the above events, and exactly in the order with which they now come, came the darkness over Egypt. The great whirlwind, the simoon of the desert, the cyclone of the ocean, the hurricane of the West Indies, visited the land, and lifted from its surface all its refuse matter; up-lifted the thick dust, and darkness ruled the land for three days. These dust storms are the prelude to the usual rainy season. I conclude that this followed in its ordinary course, for the next infliction on Egypt was the death of its first-born man and beast.

I do not take this in the literal sense, as embracing the first child born to-day, or the first born, now twenty years of age; but I suppose the deaths of tender infants and of young beasts then

took place, the food of their parents had long been vitiated, their constitutions were not capable of maintaining another existence, consequently the young ones died from insufficient or unwholesome food in a chilly season.

We are still inclined to look upon these plagues of Egypt as miracles, and as direct interpositions of God for a favoured people; they were so far favoured that they had the gifts denied to the Egyptians, whose condition was at that time similar to the condition of many nations since. The people were indolent and did not work, the king was an ignorant despot, and trusted to his magicians; these men partaking of the customs around them, were apparently incapable of comprehending new things, but depending on the lore that had descended to them, became liable to believe that Moses and Aaron brought the plagues upon the land,* and becoming seriously

* I have lately read somewhere, that there are still magicians in Africa, who run the chance of being killed if their prophecies do not come true.

alarmed, used their influence in that strain, till Pharaoh, submitting, said to the Israelites, "*Go and serve the Lord!*"

In about eleven hundred years after these events, King Necho began to dig a canal between the Red Sea and the Mediterranean; but as he lost a hundred and twenty thousand men in this great undertaking, it was abandoned. I gather from this event that the same inconvenience of travelling from Syria to Egypt existed then as we find now, and that the king desired to open his communications from north to south. The desirability of this opening has been felt for many years, and it is now in course of being effected. I glean then that this Isthmus of Suez has been formed for many years. Joseph probably walked across it into Egypt, but Moses preferred, or was guided to, a more southern route, over which the waters were liable to flow.

The whole scene is so similar now to the history in the Bible, that I assume the condition of

Egypt as to its river, and its Delta, was the same then as it is now.

If, then, I accept the Hebrew text of creation as 4004 years B.C., the interpretation of the king's dreams as taking place 1715 B.C., the digging of the canal as 609 B.C., I get only 2289 years for the growth of Egypt into its present geographical form. If I add our present time, 1868, A.D. to the 1715 B.C., I get 3583 years, in which but very little progress has been made in the growth of the land. Now, with so large a river as the Nile, and a river so loaded with matter, this growth of the land is so remarkable, that it leads one to doubt how all Egypt could have been formed in the smaller period of 2289 years.

The cultivated plains retain their flatness of surface; the river rises to much the same level in them year by year; the bed of the Nile retains its depth and its size, much the same as it has always done. Here and there its banks are

washed away, and the material carried elsewhere. But its overflowings do not heap up mounds and hills, as other rivers with their winds and currents do. Its wide alluvial plains are kept flat, by careful husbandry; their surfaces do not grow above the reach of the waters, and so great is the confidence of the inhabitants of these plains in the regularity of the water supply that, if any excess happens, the loss of life is lamentable. So late as in 1829 no less than 30,000 people were washed away by the unusual rise of four cubits to the flood.

If the Nile had been left to nature, such accidents would be more rare, because the annual floods would form banks and mounds, upon which the inhabitants would build their houses, and to which they would retire in case of danger. It is the nature of floods and winds to form these barriers; but in man's presence, and under the pressure of his wants, such formations are kept down. The plough and the hoe keep the country

level. We have, however, a proof that growth goes on. The same labour which Necho undertook has been undertaken again. A canal is now under construction from the Mediterranean to the Red Sea, but a serious obstacle exists to the success of the undertaking by the silting up of the sea at its northern end. This sediment appears to owe its origin partly to the material brought down the Nile, and forced, by the prevailing currents of mud and water, eastward to the coast of Syria. This silting up is so extensive, that ships of any size are impeded by it, and attempts are now making to dredge channels and protect them by groynes and other methods. We have examples of these protecting barriers on the sands of our own sea shore; and although no two portions of coast have the same or similar forces at work upon them, and as, consequently, no analogy will hold good, yet the groyne used by man for a similar purpose, will produce a similar result, and the material, which would

in the natural course of events, have gone on with the swell of the rolling ocean, will be stopped by the groynes, and, accumulating fast, will soon overtop the barrier, and falling into the channel render the labour of dredging a never-ending task.

Here, then, along the coast of Syria, are now stored the washings of the Mountains of the Moon ; here are atoms from Lake Victoria, Nyanza, from the Zambesi, the Abyssinian hills, and all the vast extent of country which lends its water shed to the Nile. While some of these distant washings find their way to the sea, some of them are at work in the bed of the river, resting one season in one place, and shifting their grounds in another, but every shift helping to keep the bed of the river at its proper height. One year it is scooped out by the headlong force of a furious flood, in another the hollows are filled up by the sediment of a milder stream.

We cannot tell the extent to which the wash-

ings of the earth are carried out to sea. The space is enormous, and every turn of the currents, in wind and water, affect the deposits. They are, in fact, continually changing. That which is dropped at the mouth of the river one year, will rush out to the ocean the next, and so the subsidence is perpetually changing ground. All we know is that the denudation and the filling up are for ever going on.

I come, then, to the question that if so small a growth has accrued to Egypt in 3,583 years, why should so great a growth have been realised in the first 2,289 years? Did its 1,200 miles of alluvial plains grow in that time? If so, there must have been a much more rapid progress than at present. The city of Alexandria was built 2,200 years ago upon the sea shore; it is near it still. The two growths are strange, and one is almost led to dream upon the river bank, that its waters have never formed anything; that its present delta has not been washed down from the land;

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that the land has never been denuded, or its surface dust washed or blown away; that all nature, in fact, has been standing still, upon the shores, in the bed, at the mouths of the great river which we see yearly pouring on its mud laden billows to the ocean. But, as I said before, there is a proof of growth. No one will venture to say that the great alluvial plains of Egypt are the results of upheavals, or of volcanic formation. No one will deny that they are all formed by the river, the sea, and the winds; and I feel a relief in thinking that there may be some truth in the astronomical records of the Chaldeans, which, about four thousand years ago, mention the social existence of man as having then existed for 473,000 years, while Egyptian legends go back to 48,000 years before the time assigned by us for creation.

In the book of Numbers, c. 21, v. 14, I find—
 “Wherefore it was said in the book of the wars of the Lord.” In Joshua x—13, “And the sun

stood still, and the moon was stayed, until the people had avenged themselves on their enemies; is not this written in the book of Jasher?" In the second book of Samuel, 1—18, "Behold it is written in the book of Jasher."

Here are allusions to old wars, old events, and old books, with figures, which carry us back so far, that reasoning backwards, as rivers wear away the barriers of rock. The dates seem to be verified by facts, so that I naturally come to the conclusion that all the vast alluvial plains of Egypt have been formed slowly as the Delta is forming now. Unknown mountains have been washed away, and all these lands have been formed from them. There has been, and there is a perpetual repetition of breaking down, of washing away, of sifting, and depositing by forces, which never rest. When we contemplate the effects of these forces, imagination may wander into millions of years, beyond the dates of the Chaldean records, till lost

in the haze and obscurity of time. We may exclaim impatiently, "It is all eternal, eternal for the past, eternal for the future. Eternity is promised to us as a reward, it is threatened to us as a punishment; but we must pause, and remember that the eternal God has set his laws to work, that with them He has formed this earth; that we, human beings, endowed with reason, are not only permitted to live upon it, but are instructed to hold in subjection every living thing upon it; that there is a limit to our lives, that we are not eternal in our bodies, although the elements around us may be." When this recollection flashes across our poor weak minds, and we see for how short a time our dominion extends, and contemplating the immensity of our rule, we may hide our faces in humbleness, and pray that our darkness may be turned to light, that we may be gifted with grace and wisdom to understand and interpret the signs of the times, as well as the

phenomena presented to us by nature. Such gifts are within the range of ordinary talent, if applied in the right direction, but are far away if we bind up our talents in a napkin.

CHAPTER XVIII.

“And if each system in gradation roll;
Alike essential to the amasing whole,
The least confusion but in one, not all
That system only, but the whole must fall:
Let earth unbalanced from her orbit fly,
Planets and suns run lawless through the sky ;
Let ruling angels from their spheres be hurl'd,
Being on Being wrecked, and world on world ;
Heavens whole foundation to their centre nod,
And nature trembles to the throne of God—
All this dread order break—for whom? for thee?
Vile worm ! oh, madness ! pride ! impiety !”

POPE.

I have given in my last chapter an example of the very gradual growth of land under the undoubted influence of a river. I have, in Chapters IV., IX., and VI., shown how the earth has grown under the sea. We have only got to look at the

vast accumulations of material above our coal deposits, to comprehend, that, within the same period of time, the deposits of the sea, or in the sea, are enormous, while the deposits of our rivers on the alluvial plains are scarcely perceptible, and the denudation by the rivers is great and visible.

Before, however, proceeding with the order of destruction, I wish to say another word on the system of upheaval, and I have brought in the coal mines as evidence against it. Wherever these mines are, they tell us that all the strata above the coal are ordinary water deposits, and these deposits tell us in plain language that they took a long time in forming. I assume that our deep pit coal was where we now find it, before the Deluge, and that many strata were lodged over it by the action of this water. If Dhawalegeri was five miles high, and covered by the Deluge, then Ben Nevis, our present highest point, must have been some four miles below water; if Ararat only was covered, then our highest land was only

some 1,200 odd feet below the surface. Either of these depths were sufficient to produce great changes. I have shewn how rapidly the waters of the flood subsided, and as we witness the destruction caused by ordinary inundations, or the bursting of a dam, we can imagine the havoc which the great waters of old brought upon these regions. In whatever shape the islands were, we have every reason to suppose that our present mountains existed then, and taking into consideration the height at which we find water deposits, and other traces of streams, I come to the conclusion that our highlands were of greater elevation formerly than at present, and I will look to Devonshire as an evidence of this theory. Dartmoor is now an extensive undulating plateau, over which are scattered fragments of granite rock, while here and there are found large masses of granite (in situ), called Tors,* isolated, and bare rocks; the upheaval theory could scarcely

* Such are the Hey Tor, Hounter Tor, and Vixen Tor, with many others, while similar stone mounds are found in the lower ranges of uplands.

account for these varied characters, while the water construction and destruction would provide completely for the results we find. From this lofty plateau many rivulets find their way, their beds are rough, irregular, and winding ; they sometimes run through a small morass, now they twine amongst vast masses of broken, but rounded granite, now over flat tablets of the same, in some of which great bowls or hollows have been scooped out by the little waterfalls. These streams eventually tumble down the mountain side in little channels, cut in narrow dells, encumbered with vast masses of broken and well rounded rocks ; all along the sides of the hills these broken and weather worn fragments rest in great and almost inextricable confusion.

Now, as granite, whether upheaved or deposited, was originally formed entire, with the exceptions hereafter noted, I can only explain the present state of things to have arisen from the breaking up of a vast granite formation, and the

only remains of this, upon the surface, are now seen in the broken masses, and in the proud old Tors. These Tors then represent the general height of these hills, as left after the Deluge; how much higher they were before must remain unknown, but the general mass of broken fragments at one time formed much loftier summits than we now see.

The exceptions above alluded to were the cause of all this breaking up; an upheaved mass of granite fused, and prepared in the lower regions of the earth, would have got rid of all impurities, and come up a clean melted mass; it would have collected no foreign matters, and would have settled down in its own integrity—but a mass collected, as this undoubtedly was, by water, would have within its masses materials of other sorts—and we must look to the locality to say what materials these were.

I would refer my readers to the geological maps of Great Britain. It will be seen that our

granite masses in Devonshire are in patches, approaching the circular formation ; while here and there between the Lands End and Somersetshire, the granite crops up in segments of circles. The same features attend granite in Aberdeenshire and other parts of Scotland, while in Ireland it takes more the form of banks. I believe that these latter were formed upon the edges of the currents of the sea, while the others were formed by whirls. There was doubtless a great system of whirls and eddies at work in these islands, and we have only got to look at plate iv. in Captain Maury's admirable work, "The Physical Geography of the Seas," to understand how these whirls and eddies may have been brought about. These Dartmoor hills were then, I assume, formed upon the whirling system ; although the grains which formed these masses were the chief ingredients wafted upon, and deposited by the waters, yet no whirl is so exclusive as to employ its attractive powers on one object only ; other

materials consequently found an entrance to the heap, and were buried, as they came, with the grains, eventually combining into granite.

In the vicinity of granite masses we find clay-slate, oolite, and gneiss; the latter I put down as a sediment composed of the same, though of finer material than granite; the oolite as matter washed away from the granite; and the clay-slate is probably a deposit collected by the waves, when the rough hard barrier of granite formed a quieter and less troubled sea.

Taking, then, the mass of Dartmoor granite as a water deposit, that here and there it was streaked with other materials, I will consider the action of the Deluge or of any water upon the mass. I would apply any other flood to the purpose, but I know of no other that could do its work so well. I cannot suppose that any other than a universal deluge could have overtopped and ruined these masses built up by waves of old, and nothing but a very violent flood could have effected the destruc-

tion I allude to. Earthquakes, or electricity, or volcanic action may have destroyed mountains and levelled them with the dust, but why should any of these agencies spare the centres, or any hard portion of them? Water only could have done this, and to water only I ascribe the destruction which we may see upon those hill-tops.

The system is further explained by examining the position of the broken granite masses; some rest flat upon the surface, some at varied angles, and some stand upon their edges upright. There is no force so capable of bringing about these results as water. When water flowed over these hills it found out the foreign substances of the masses, and washed away the soft ones, the granite consequently parted under the influence of the waves and fell in all directions; then another action took place, the earth was slowly, and in all times has been, removed from beneath these fragments by the constant action of the

rain. As they became undermined they fell into such positions as the situation allowed, and hence arises the confused arrangement of the granite masses.

Our geologists have told us that all these granite formations have been upheaved from below the earth's surface; they have not explained how the cavity from which they came has been filled up, or whether it is a cavity still. Someone has written that the very appearance of granite testifies to its fire origin, but they might as well say so of the burnt up sands, or the asbestos of Egypt, or the sandstone rock, or even our coal mines. I allow that some of the ingredients of granite may have been subjected to fire, but as a mass this has not been the case, unless it may have been accidentally liable to the spontaneous fires of the surrounding herbage in dry seasons. Such fires are not uncommon in waste lands. We have all heard of the prairie fires; African travellers have written of them, and in India they are very fre-

quent. Spontaneous, or intentional, man has to take precautions against these fires. The fortress of Asseerghur, on the top of a high, scarped hill, but surrounded by wild jungle, has yearly to be secured from the effects of fire. These burning jungles form grand sights as the flames, driven by the winds, rush onwards, hissing, screaming, and cracking, the conquerors of all before them, till they meet in their headstrong course the usual barrier of nature—the water broken scarp, or the rain-denuded rock. Now these fires neither fuse matter into glass nor melt stone into slag, but they burn up substances into ashes which, when the rains come, are converted into masses of stone-like substance. The tops of high hills in Western India are strewn with these substances, but they are not the result of upheavals.

I will not say that no upheavals have taken place; I am willing to believe that volcanic agency has caused them, but these upheavals

are local, and do not affect the whole system which rolls on in its formation, or in its destruction, without confusion and with infinite regularity.

I think that our geologists have, by ascribing too much to upheavals, injured our faith in the natural laws of creation and infringed upon universal order, and this appears to have been partly done with the view of making creation subservient to man. Man is the acting ruler of what is made, but we must remember that man is subservient to creation; that in all history he is liable to the results of natural laws, that though by great knowledge, or by great gifts, he may foresee and foretell events, yet he cannot avert that which nature, left to herself, is sure to bring about.

Pope used strong language against the presumption of man in reference to his aiming at more knowledge and perfection, and considering himself as the final cause of creation. I will

here say that I am content with the system of creation as the Bible presents it to us, that I accept the words of that wonderful Book not in their simple abstract meaning, but as beautiful and correct outline pictures, drawn by the figurative, eloquent, and expressive pens of the East, exhibiting to us times and facts, which, aided by legends, were possibly within the comprehension of man in the days when they were written, but must now be accepted by us as true as far as they go, though enveloped in the haze of mystery and distance unknown.

I come then, to the conclusion that even as the sea is forming banks and shallows beneath its surface now, so was the earth formed by it of old, that from that time to this life and death have added their wondrous accumulations; that storms, and snow, and hail, and rain have each in their turn fulfilled His word, and that fire has in its place and its turn contributed to a re-creation. I use this word, as I do not think volcanic action

existed till the water had buried masses of inflammable matter. We know, to our cost, how the gases are stored up in our coal pits, only requiring the presence of fire to ignite and spread destruction according to their powers. We know that the earth is full of combustible materials—the oil bubbles up to the surface, there are lakes of liquid pitch, there are our oily shale rocks, the sulphur, lignite—all the produce of the earth's surface. Far down below all these, at depths to which man has not yet reached, other substances may have been accumulated in olden times which, with their vapours and their pent up gases, produce the occasional eruptions and convulsions of the earth. When once a passage is found for the outpour of its fury, this passage is preserved till the force below demands escape, and this fluctuates. Our surface winds do not always blow with violence, the rain does not always fall, and rivers do not always run, but the great sea goes on for ever, its tides and its currents never cease; within these

elements our earth maintains its situation, its changes of season, its variety of atmospheres; all work by one great law; we may be afflicted with cold, and suffer from the heat, but we must remember that we share these changes with the vilest worms of the earth, and have no more control over them than these worms have.

We are gifted with that most wondrous gift, reason; but there is nothing on earth too low, too humble, or insignificant, from which man may not derive a lesson; a string of dead seaweed tells of the coming rain as truthfully as the elaborate barometer; the store house of the little ant tells us that she knew harvest time was come; the chrysalis tells us that the butterfly summer is over; and the gathered honey tells us that the sweet labours of the bee are ended for the season; the autumn showers begin to fall and replenish the dried up springs; the sun gets lazy in the morning, and retires to other worlds in haste; we gather our harvests into our garners, and lay

up our winter stores ; the fleeces grow upon our sheep, and the long coats grow upon our horses ; all runs on in one beautiful stream of gradation, there may be exceptional interruptions or alterations, but the whole has rolled on and will roll on, not for man alone, but for the vilest worm as well.

Having thus attempted to show that there never has been any spasmodic creation, and that the universal denudation goes on without confusion, I will endeavour, in another chapter, to sketch some of the effects of the subsiding deluge.

CHAPTER XIX.

" Swift to its close ebbs out life's little day ;
Earth's joys grow dim, its glories pass away,
Change and decay in all around I see ;
O ! Thou, who changest not, abide with me."

READER, did you ever see a flood ? a yellow mass of furious water rolling over and contending with the ever changing and curving surface of the earth in irresistible volumes ? There are few level places on the earth ; the great deserts are not level, as beautifully shown in Palgrave's description of his journey through Arabia, where even the Arab, who had wandered through those waves of sand from his childhood, and was familiar with every sign of the pathless waste, was puzzled how to find

his way over the moving surface, where the foot-mark of man was blotted out immediately, where all is dry, desolate, and burning hot, a region dreaded by all, on emerging from which the wandering Arab falls upon the earth, with his face towards Mecca, and thanks his prophet and his God for an escape.

We are sometimes led to think that there are levels, the mirage deludes us with the idea, and I have climbed hill tops in the hope of finding their plateaus as smooth and regular as the long, straight cloud which hovered over the brow in the cool of the morning; there was no level there; all was undulating, full of hills, and woods, and little vales, rough places and smooth, deep ravines, and abrupt pinnacles, while below them there rested one of those pictures, which I will borrow from Sir Walter Scott.

My upland lake lay in profound quiet, its surface lay undimpled, save where one of the numerous water fowl which glided on its surface

dived for an instant under it, 'forming' so perfect a mirror to the bleak hills by which it was surrounded, and which lay reflected on its bosom, that it was difficult to distinguish the water from the land; nay, in the shadowy uncertainty occasioned by the thin haze a stranger could scarce have been sensible that a sheet of water lay before him. A scene of more complete solitude, having all its peculiarities heightened by the extreme serenity of the weather, the quiet grey, composed tone of the atmosphere, and the perfect silence of the elements, could hardly be imagined." The water alone was level, its shadows were beautifully irregular, and the very fact of the lake's presence, though aided by its moisture the gathering of the straight cloud, proved the unevenness of the earth.

Over this ever-changing face of nature the rain had poured down, against it the troubled ocean had arisen, the soil was soon saturated, and little streams ran off in all directions in their

headlong haste to find their level; the deep ravines became broad roaring volumes full of matter, they filled the rivulets and the rivers, the wide plains are covered over, the hill slopes are attacked, the trees, with water loosened roots, give way, and plunge headlong; the lower hills are swallowed up, the animals are mostly gone, the weary birds seek in vain for their usual resting places, and fall confused upon the greedy wave. Man, accustomed to danger, and acquainted with the places of refuge, has sought his usual sanctuary; but the wave, sparkling in its anger, overwhelms the hill top, its sacred spot is despised, its shrine of sacrifice is rejected, all is swallowed up, and the foaming, bubbling waters wash hither and thither in confused and reckless tides.

Here and there strange scenes may be witnessed, the great trees rear up their heads, broken and shattered, to look once more upon the dusky light of frightened day; upon them and around them are weird and ghastly figures, man and beast

contend for a moment for that which appears as a resting place, or a refuge—vain contention ! The strong whirl had only seized the rooted tree and, swinging it round in its fury, had raised for an instant the dishevelled head ; round and round it goes, laden with its ghastly load, its strange companions in adversity, and, as the whirling centre seizes its prey, the whole go down together into the seething caldron.

Life has ebbed away, the raging element has done its duty, it has pulled down high places, it has filled up the hollows, and now at its height is depositing its varied loads with the greatest care. I have shown in Chapter VIII. how the little floods helped to raise the land, how they used their energy and skill in stealing from one place and depositing in another, how they built up the caves, and bestowed upon man a copy for the beautiful arch.

Now man and his architecture have been submerged. Man, supposed to have been in a high

state of civilization, supposed to have been more numerous on the face of the earth then than now, has disappeared, he has gone away upon the seething flood.

I have called our present generation a curious one; we enquire and we search, but we have not yet come across the bones of antediluvian man. Where do the remains of all that vast population rest? The mythical hyena did not carry their bones into his den, because he also was washed away. We do not find man's remains treasured up with the bones of the elephant and rhinoceros. Man had the gift of reason, and escaped from the little floods, which filled up the moulds for the caves I allude to. But when man and beast were washed off together in one great and universal deluge, how is it that we do not find their bones mixed up together in some of these receptacles, these beautiful and natural mausoleums of the land?

The probabilities are that in so sudden a destruc-

tion some remains of both would have been lodged together; but the absence of man's bones from the caves and the bone heaps I allude to, is a strong proof that these were collected and covered in before the flood. The absence of man's bones from our caves, our drift, our limestone, and our chalk, appears, then, to me a direct evidence that all these were formed before the Deluge, and that the last resting places of the lost peoples may be looked for in other regions.

There are great banks accumulating even now in the regions of Newfoundland, but the material for these is supposed to come chiefly on icebergs from the north. The bottom of the sea shelves upwards from that direction, but the face of the bank towards the Gulf Stream is abrupt. Although icebergs may deposit their burdens now, some previous arrangement was necessary for the interception of the first voyagers from the frozen regions, and I look for this intercepting cause in the system of currents. The Gulf

Stream runs strongly on the deep side, while the currents from the north run gently and with a doubtful stream towards it. There is consequently a dead water between them; in these dead waters the materials accumulate from the north seas, while the fluctuating Gulf Stream washes the southern face with a perpetual waving current, performing the same ceremony under water now, as I have said before was performed by currents in the formation of the world; one side of a current or eddy-formed bank, like the ripple on the sand, is abrupt, while the other slopes with a gentle incline.

Now, in the bosom of such banks as these, in the foundation of the larger banks, in the south of the Indian Ocean, or in the North Pacific, or in the middle of the Atlantic, wherever is found a weedy sea, where currents of winds or water leave a quiet space, there we may look for the refuse of the great Deluge.

Having thus assured my reader that I am not

about to rake up any awful sight of dead men's bones and antediluvian skulls, I must go on with the destruction of the flood. Man is destroyed and carried away on tide and current, its swirls and its whirls have buried them in places to be found by future races; the restless waters have insinuated themselves into all the stratas, they have washed out the soft from the hard, and have undermined all places where materials were found liable to be washed away. As the flood subsided the rocks fell to pieces, great scarps or cliffs were formed, land slips took place, and the sloping downs fell asunder, segments of hills were exposed in their chalky whiteness, their blue flint lines were opened up, and the secrets of the earth—that wondrous mausoleum—were disclosed; the chalk and the flint told their tales, and exhibited all that was left of uncounted myriads of lives; the land slips showed where the great Saurians had revelled at their ease; the broken marble told of its clustering inhabitants, the stubborn

Tor declares its strength, and boasts in the multitude of its washings, while segments of caves mourn for the remnants of their arches and their contents, which they had hitherto preserved so well.

The baffled destroyer sinks and runs away, while the laughing earth springs up in its glory and in its renovated nature. But all along the water line its contest still continues; angry with the past, greedy for the future, the never resting wave works on and eats away the stratas that submit to him. Our white cliffs of Dover testify to his power and their weakness; bit by bit, or mass by mass, they have crumbled and fallen away to what they now are; our sea coasts of Norfolk and of Sussex have fallen victims with many other places, and their antique spoils, their antediluvian burials, have been wrenched from their careless hands. The elephant and the bear, the tawny hyena, and numberless other beasts which roamed the Alpine retreats in the days of yore, are dug

up again by the waves which buried them, and tell to our wondering naturalists a tale that is scarcely yet comprehended.

We are taught in that wonderful work of research, "The Animal Kingdom," by Baron Cuvier, "fossil remains," that the general circumstances of the bone caverns are "extremely similar;" the hills which contain them are all calcareous. I have fully described their formation in a little work called, "New Pages of Natural History." Their destruction has commenced. Here and there upon our sea coasts we find portions of vast caverns cleared out of their contents; scattered about at the bottom of the seas we find numberless bones exposed from time to time, and these bones prove by their condition that they have not been long acted on by the water; they are, in fact, washed out of their catacombs as the searching wave discovers them.

They are found in great quantities off the coasts of Sussex and of Norfolk, where our chalk forma-

tions are broken by the sea. I have talked before of alpine retreats and the water sheds of the Rhine and Elbe. Opposite to the above chalk formations are similar veins on the coasts of Europe. It is by no means improbable that the undulating downs once kissed each other, that there was no English Channel, as we now call it, but that England, Scotland, Wales, and Ireland were broken up into many islands; the water channels between them are still visible in our sandstones, oolites, clay, limestones, lias, and carboniferous deposits. All these channels had, as I have said, filled up before the Deluge, and now its retiring waters, denuding and robbing its softest and latest deposits, wore them away below the former levels.

To enable my readers to better understand the wear and tear of water, and how it was that the Deluge, or the rains since then, have succeeded in exposing to our view materials buried by running water in places where we can scarcely

imagine water ever ran, a wonder that I have above said is not absent from so great a thinker as the Duke of Argyle, I will carry my sketch to a spot familiar to many. I have before visited an imaginary bit of the Rhine, let us now look at that beautiful and romantic gorge through which the Via Mala leads to the Sphegen pass.

There is no road there in my picture, it is all rough and desolate, the chamois stands at gaze, unfrightened, on the edge of the precipice, a herd of elephants roam through the tangled woods on the slope above, the tawny hyena lays basking in the sun on the sand by the water side, and the croaking vulture, with his bloody beak and polluted talons, comes to drink from its carrion feast. The water from which he takes his fill is not the dashing and beautiful stream that now is, though cascades and great falls were even then plentiful, but it was a broad, quiet pool, ponded up by a barrier of strong rock, where the Via Mala first opens out from the gorge ; from this water there

was a lovely fall over the barrier, which in those days connected the now castle-bearing rocks with the mountain on the other side. These castles are now many hundred feet above the stream, which at the time I allude to ran level with their tops.

Going on from thence down the stream, we find that where these charming ruined castles, the vestiges of middle ages, now stand, by the Lake of Constance, the water still flowed on. Where Ehrenbreitstein raises its turrets some eight hundred feet above the waters, there also they reached nearly to the top, and ponded back by the barrier rock, between that place and the site of the present Coblenz, they fell over in a glorious fall. There was no Cologne and no Rotterdam in those days, but the great river ran a devious course in those channels, which I have said ran through the then islands of the now Great Britain.

The resemblance of those ancient islands is

shown in the present ones, between Ostend and the Hague, from Amsterdam to the mouths of the Ems, the Weser, and the Elbe, from thence along the western coast of Denmark, and all through the beautiful fiords of Norway.

It will be opposed to this theory, that there are wide plains along the course of the Rhine, which must necessarily have been under water; to this I will say that there were, and that the whole country from Rotterdam to Frankfort, or beyond Strasbourg, was in all probability cut up into fiords and islands at the time I allude to, while before that these inlets extended much further back; but in this space of country are many hilly districts, and the wash from these, gradually filling up the spaces alluded to, in time confined the river to a smaller channel. But while it was still running over higher levels the events took place which are sketched in Chapters VII.—VIII.

Our geologists have written much on a great drift, which has visited these islands from the

north. No period has been assigned to this drift, and now, at the subsidence of the Deluge, was the time for it to happen; the low sandy isles, and banks of chalk that connected Europe with these islands, softened and saturated with water, became easy plunder to the destroyer, they were washed away, and the countries were disunited.

Land and sea have both altered much since then; the Rhine has found a lower level, and ignores the limestone hills in which it left its relics long ago. The water channels across Scotland, England, and Ireland are all filled up with materials sent before the Deluge, and that great catastrophe further denuding the hills, filled up the plains, deepened, and worked back the river beds.

We do not conceive that the peaks of the Himalaya mountains, the Materhorn of the Alps, or our Dartmoor Tors, were always as we now see them; the deluge left them nearly in their present state. Rain, and snow, and storm fulfilling

His word have brought them as they are, every year they steal the fragments from them; but these peaks were once surrounded by sunny slopes and fruitful plains—time destroyed these and washed them away. The congealing snow rested on them, and every season, as the warmth of summer came, the avalanches fell, laden with the loosened debris of the mountain tops, and so their “glories pass away,” they “change and decay” in a perpetual routine, so slow that the legends of man scarcely note it, while the brief reason of man occasionally ignores it; full of doubts and uncertainties, learning to-day and unlearning to-morrow, the mind of man flutters on from one thing to another, and accepts a well argued theory as a truth. I write my impressions in a plain unvarnished tale of the law of nature, a law which has been going on from time unknown, and will go on, under the sure guidance of Him who changeth not.

CHAPTER XX.

"Who is as the wise man? and who
Knoweth the interpretation of a thing?"

HAVING thus, by a slow and almost imperceptible process, brought the dry land through many millions of years to the surface of the water, having divided the waters below from the waters above, and again united them in the Deluge, and having then given an outline of reconstruction and denudation, till our earth has assumed its present shape and appearance, I will now endeavour to sketch the wisdom with which we interpret events that come before our eyes, and the intelli-

gence with which we hold our dominion over all that liveth on the earth.

“Know thyself” was a wise saying when uttered, it is wisdom still; unless we acquire that knowledge we become as the weathercock that turneth with the wind. Having acquired that knowledge we may discover that there are many things which, happening daily before our eyes, may not be comprehended, many in which we may be mistaken, many to which there are two interpretations, and many which admit of only one.

Wise men, prophets, magicians, soothsayers, oracles, witches, wizards, spirit rappers, illustrate the previous sentence. To the spirit rapper there is only one meaning—deceit. The witches or wizards may be good people, though they come under the denomination of bad; the oracle was uttered in vague and doubtful terms; the soothsayer or omen explainer was oft-times mistaken; the magicians could not interpret; and though

there were false prophets, yet the true ones were on a footing with the wise men, and knew the interpretation of a thing.

From the beginning of legendary lore down to the present time, we find that man continues the same: he has a desire to discern truth, to look into the future, and to comprehend things which may not yet be known. Pope found the vanity of man when he wrote,

“ Great lord of all things, yet a prey to all;
Sole judge of truth, in endless error hurled;
The glory, jest, and riddle of the world.”

Charles Fox exhibited the latter line in the last century, when he submitted to the artifices of a sensible woman of the world, who advertised to give valuable advice for half-a-guinea, and when he exhibited himself as the sincere friend of freedom, and of the best interests of mankind. In the present century we find a lady running into similar jests, and losing all her property in

the vain attempt to be "beautiful for ever," and to get a real lord for a husband.

I have shown what appear to be errors in the course of my sketch, but which are accepted as truths by many.

We all know what slaves we are to circumstances and to fashion.

It is no uncommon thing to hear men of wise repute, with followers and admirers by the thousand, talk of these "latter days," not as if they were talking of their own approaching end, but of the end of the world; others prophesy of the fall of empires, then we condescend to the elements, and tell of rain, or frost, or meteoric exhibitions; we endeavour to measure the distance of the earth from the orbs above, calculate the reappearance of comets, and tell our wondering listeners that there is iron in the sun. However right or wrong those may be, who apply their talents to these subjects, and however immaterial it is to the world at large whether they

interpret rightly, I see no advantage in endeavouring to exercise a dominion over that which is not placed under us, and I object seriously to those who aspire to see the end of all things.

We are told that this cometh as a thief in the night. This thief visits individuals frequently, as we have lately seen in the melancholy catastrophe near Abergele, where upwards of thirty people were launched into eternity, without sign or knowledge of danger. But the end of all things is not yet, and as far as man can see there is no more chance of the end of this world now than there was millions of years ago. It may be urged that the presumption of saying this is equal to the presumption of foretelling the end; but it must be remembered that my objection arises from the other assertion, and I only say, as far as man can see.

Wise men have been, and I have given a few well-known examples of their foresight and interpretations. Some of our philosophers assert

that the human race goes on improving ; if this is the case, how is it that the gift of prophesy has departed from us ? Why can we not interpret ? “ A wise man may think to know it, yet shall he not be able to find it.”

It seems to me that we are far behind-hand in the exercise of those gifts, which, if cultivated, would enable us to do, and to know more than we do. We are educated, but we fall into one groove, no attention is paid to any peculiar faculty, and every boy in the class, or in the school, goes through the same routine. When we leave school we follow such pursuits as our education has qualified us for, or enter such professions as our natural guardians have selected, without very much enquiry whether the requisite qualifications are, or are not, possessed ; true it is, that examinations are passed as a test for particular occupations, but though the examined may be found fitted to fill such situation, it does not prove that he would not have been better fitted to do something else, if notice having been

taken of the bent of genius, that inclination had been duly cultivated.

Many of us, therefore, having left school, on finding out early in our career that the education we have received has not been according to our talent, at once throw off the leading strings, and pursuing a course of study of our own, discover in the first place, that much valuable time has been lost, and that much which has been acquired by the mind has again to be forgotten. The circumstances of some people enable them to change; the force of others puts them in the right direction. Examples of these changes from one education to another, and from no education to the height of learning, or of skill, are plentiful; but there is a vast concourse of human beings whose talent, blighted from the first, never gleams again, or if it does flicker at all, becomes like the Egyptian hieroglyphic given to us by the inimitable Quarles,

“ My feeble light is thus tossed to and fro,
The sport of all the envious winds that blow.”

This education is a delicate subject, and men's minds in England are at present dwelling on it. Every one strives to teach his poorer neighbour, and vast trouble is taken in the matter.

Since writing this, I find that Dr. Grierson has read a paper to the British Association, at Norwich, on education and science, in which he says: "The only effectual mode of education was that which appeals to nature," and he advises "teachers to take their pupils to a museum, a garden, or the seashore." I would add to all, wild nature, if there is inclination for it.

It is quite possible that every here and there a mortal will be raised from his normal condition into a higher sphere. It is quite within the bounds of possibility that many more men may rise from the lower grades into situations of mark and usefulness; and with the chance of meeting one such in a century I would not wish to decrease the efforts of the education school. But when I see that these efforts frequently tend

to avert the minds of our labouring population from the duties to which they were born (duties which must be fulfilled by some one), without qualifying them to fulfil any other duty, I lift up my feeble voice and cry aloud against this system of general education. There are myriads of people in the world, there are countless leaves upon the trees; as there are no two leaves alike, so are there no two individuals similar, either in face or mind, yet all are subjected to the same mechanical tuition, and all leave it, as a rule, with disagreeable impressions of it. There is another evil attending this system, which has been brought to the notice of the public, and which cannot be too often repeated till a remedy is found for it. Our young people of many classes learn to read, and indulging this propensity fall in with books which inculcate no good. Their "little learning is a dangerous thing," and has in many instances led them into evil ways. We are a free people, we may write what we

please, and read what we please ; there is a limit to obscene prints and pictures, it is true, but there is no limit to that literature which goes under the name of sensational ; this, frequently dressed up in fair language, inflicts more dangerous wounds than a plain picture of evil. Examples of impunity are held up before the young, and away they go down the beaten track.

Our system of education can be traced in higher circles than those above alluded to. The son is for the church, and is brought up accordingly ; but when entering on his duties he finds his talents unfitted for the situation, and dwindles down into apathy, or rises up in a line of his own, till his gifts are conspicuous beyond his duty.

We live in a forced system, but we take no care that that system is pure ; our little world is very full, and occupation for our future generations is looking scanty, our young people start for everything, and every one is qualified to fill the place he gets ; things go on in their even way

and the man succeeds wonderfully in that which would do very well without him. But when the work runs out of its groove it often happens that the man, whose duty it is, becomes unfitted to control it. Our Indian Mutiny was a case of this sort ; if men fitted for their duty had been there it would never have occurred. The outbreak in Jamaica was an example to the contrary ; the right man was there, he acted with spirit and independence, and England did all she could to suppress this spirit. It will be an evil day for her, when she stamps out the natural energy and genius of her sons, and binds them all upon the rule of her own law.

We have distant dominions which are placed under that which ought to be efficient control, but we labour to destroy that efficiency in more ways than one. It is supposed that able men are selected for the charge, but we unite these charges to our home offices by the endless electricity, and taking away the real duty, leave

only the nominal. The man, then, who is placed in charge is not the wise man. Is this true of many offices?

In private life the thing is different, each man applies himself to the situation or the employment that he fancies; here and there are bright examples of genius rising from varied stratas of our people; these may be looked on as wise men. Their natural gifts guided them in the paths selected, their talents were placed out at interest, and I may point to two individuals as illustrating the system—Mr. Peabody, of America, and the first Sir Jemsetjee Jejeeboy, of Bombay, men who, working honestly and laboriously in their vocations, acquired that wealth which mortals so often seek in vain; having acquired it they both sacrificed that vanity of riches common to humanity, and devoted vast sums of money to the benefit of aliens and the poor, exercising the wisdom of dominion by their actions.

I could mention many, who have in like man-

■

ner used the gifts which God gave to them, not only for their own but for the benefit of others; every one in his own circle will recognise similar examples. As far as I can discover, these men owe their positions more to their natural and unaided talents than to any benefit derived from the system of education. So it goes on; a spec of spray may rise from the ocean to the top of the lofty cliff, but the great wave breaks, and foams, and scatters, and runs back again to the deep.

Thus we exercise our dominion over a world in which there is no sameness; everything that we see or hear of has a difference; differences multiply till variety has no end. Yet we endeavour to rule all this variety of nations, of animals, or of vegetable life, by fixed rules, and unalterable laws, and by one method of education. Nature goes on—however well, however ill our duties are conducted; but our natural interpretation of nature's rules is a lost talent, it is one that we tie up in a napkin, and trust to the scientific in-

struments, which we possess, to tell us what to do, and yet all around us we have the means to arrive at natural interpretations. The fish rushing to the rapid shallows tell that winter is gone. The thrush sings his peculiar song, and the cat scratches the tree to tell us of approaching rain; the rocks foretell a stormy day; the little ant, foreseeing a colder wind, declines to bring her white eggs to the surface; and the wild fowl flitting to the south on eager wing, tell us that winter is come again. There are thousands of indications of change, which only require attention to be properly interpreted, and he who can interpret nature right can also tell what man will do, and what he will come to, travelling on one beaten track. Daily we reach our bourne; we may have done much, we may have done little in the line of life to which our duty bound us, the records of those deeds lie hid in fleeting memories or in dusty records, and we drop into our graves as a drop of water into a fleece of wool.

Looking over our cemeteries, I find grand records of deeds gone by; these are reserved for Westminster Abbey and our beautiful cathedrals; but on the slate and marble slabs of our more numerous villages I find the common results of the common education—"He lived the allotted time of human life in peace and charity with his neighbours."

Many a wise man has had a smaller epitaph than that.

CHAPTER XXI

"As it was in the beginning,
Is now, and ever shall be,
World without end. Amen."

I COME, then, to the unavoidable conclusion that man, to whom was entrusted the dominion over all things living upon earth, to whom reason was given, so that he might be fitted to perform that duty well, fulfils it more by accident than by design.

His ideas of creation have always been more in reference to himself than to the great, the wonderful, the beautiful design of the Creator.

His thoughts on the making the dry land are contradictory, and frequently untenable in detail, and in the whole his theories of time are erroneous, inconsistent, and narrow.

He gives to the Creator of Heaven and earth, of all that is in both, the Creator of sun and moon, and stars, and of all the heavenly hosts, a limit of power, as if he was limiting a human being; man has limited the Creator of life to one monad, and all the varieties of each distinct class of animals (man included) come from that one. Shall I have the power to raise the thoughts of my fellow creatures from that narrow groove, and open up to them a view of might and majesty, of eternity past, and a "for ever" to come?

How often do we repeat the heading of this chapter without accepting its full meaning; as the weary sempstress plies her familiar needle and thinks of other things, so we pass these familiar words without heeding them.

I have mentioned above the boundless limits.

given to this world by the Chaldeans and the Egyptians; but in the inaugural address of Dr. Hooker to the British Association at Norwich, August, 1868, I find that 20,000,000, 400,000,000, 500,000,000, and 600,000,000 of years have been given as dates for creation, and that other philosophers have assigned to the habitable globe an age far exceeding the longest of these periods, "and surely," says Dr. Hooker, "in estimates of such a nature as the above, that are calculated from dates that are themselves hypothetical in a great degree, there are no principles upon which we are warranted in assuming the speculations of the astronomers to be more worthy of confidence than those of the biologist."

There is wisdom in these words, and they strengthen me in writing again words which were jotted down before they were uttered. Surely if the variations in the theories of creation can be reckoned by hundreds, or tens of millions, we may as well call it all eternity.

Six hundred millions of years are so close an approach to "for ever" that I find no more difficulty in accepting an eternity than that fixed though invisible limit; I can grope about for events, which happened beyond that date, as easily as for those which may have happened within it; I can tell when the old and broken oak was a sappling by the number of circles in the wood of its stem, but the circling stratas of our earth have never yet been so exposed as to enable man to read its age; there have been buildings up and pullings down, construction and re-construction, modelling and remodelling, till dates and history are lost, and I think with Coleridge when he said, "Antecedently to all history, and long glimmering through it as a hazy tradition, there presents itself to our imagination an indefinite period, dateless as eternity."

Imagination may run back to this period, it may revel in the lost histories of the battles of the gods, and look with gasping curiosity on the

pages of the lost book of Jasher. It may pass on, and wonder why no interpretation has been given of that God, in whose likeness man was made, though no man hath seen God at any time. It may rest unsatisfied with the explanations that have been given regarding the sons of God, who took unto them the daughters of men. It may dream of the fruits of the ground that Adam fed on before he was condemned to labour as a criminal; and it may wonder why the age of man was reduced from the nine hundred and sixty-nine years of Methuselah to the present three score years and ten, beyond which life is pronounced a labour and a trouble.

We may bestow a passing thought why man, on creation, had the herb and the fruit tree given for food, and why after the flood everything that had life was given him for food. These are subjects inscrutable; but we may pass on down the page of Bible history, and seek for people who are mentioned there. Where are the namesakes

of Shadrac and Meshac? They are in India, in the hills of the Deccan, a conquered people, and outcasts, and once robbers, still outcasts, but an industrious people. Where is Bel? Jeremiah, 50.—2, “Bel is confounded.” Bel may be found in the present Bheel, a conquered and reduced people, now living in the Syadra range of mountains.

Both these peoples live among the Hindoos, but maintain their own religious rites and customs, and thus we come on gradually to historical times. These races lived in the land, and were conquered by the Hindoos, and the Hindoos were a nation before they reached these lands. They, or a people from whom they sprung, gave the grand name to the mountain, which I take for my title; even for that there is no date; but amongst the people who gave these names, there are still the antique customs, which are detailed in the Bible as if they were written yesterday, and putting together the ancient customs and the

ancient names, I come to the conclusion that the Hindoos, or a people from whom they sprung, were cradled on the sunny slopes of the Himalayas, and the Hindoo-koosh. (I may here allude to the word *Shaitan Satan*, a Hindoo word used nearly all over the world). When this happened no one can say, but the Hindoo still bears the stamp of a beautiful creation, and may readily have given the idea of a god-like origin, and hence may come the sons of God, though they were, as Adam was, the offspring of the earth.

In looking round we find peoples of many characters, of many appearances; there is a diminutive bushman in Africa, the gigantic Patagonian in South America, the degraded South Sea Islanders, and the proud Indian warrior of North America. The flat faced Chinaman, and the thin faced American, these, with many other races, are utterly unlike one another—they vary in details. There is savage and civilised life, eager competition and drivelling apathy;

there are human beings without ideas beyond those which emanate from bodily wants ; there are others whose minds are busy with all the world.

Looking at the animal kingdom, we find a greater difference, and an infinite variety. Fossil remains are not similar to the same classes which now exist. Professor Huxley tells us that " the ancient crocodiles differ from those which exist now in the structure of the backbone, and in the position of the nostrils ; but they do not differ from existing crocodiles more than existing crocodiles differ from one another ;" but he continues, " we have no warrant in tradition, or any authority for assuming that separate species of crocodiles were created at distinct and separate intervals through a period extending over millions of years."

He leaves his audience to select any system they may please, but tells us that his theory " is that these several species have been developed by

the operation of natural causes, and of our primitive stock." Naturalists have observed that shell fish, exposed to stormy situations, prepare much thicker shells than those of the same sort in calm localities. Thus it is in all nature. Instinct, reason, shape, appearance, organization, strength, activity, speed, or slowness, are all found where nature demands their presence; even colour changes with the season or with the locality; the same fish in different waters assume different colours, and the curious may discover that an infinite variety runs through the prickles of our common horse chestnut, and that it is difficult to discover two spikes on the same furze bush similar to each other.

Nature does all this, and man, in attempting to improve our nature, grafts or buds from one tree to another. The leaf produced from the graft retains the power of using the gases or the moisture around it in producing a fruit similar to that of its parent tree, but the seed of that grafted

fruit refuses to propagate the altered fruit, and returns to the stock of its old root. Man obtains mules, but mules do not reproduce. By care and attention man has discovered many varieties which nature produces; the apple of the potatoe will produce many changes from its seed; and the ingenuity of man is shewn in selecting from these changes the root which is most useful.

We may, then, take it for granted that man is unable, and nature is able to produce from one stock many varieties of living organisms, or of vegetable kinds, and these varieties may be so numerous, and to the outer eye so separate and distinct as to obtain different names and to be applied to different uses, but science claims them as of one stock, and thus one monad may have been claimed as the origin of all life.

There are lower creations in the animal and vegetable kingdoms so distinct and so confined to particular districts, that we feel obliged to allow that they are indigenous to such regions. Man

appears to have had the power of locomotion for ever, and to have been found in places without a trace of his journey being left. Seeds may have been conveyed on the wings of the wind, by birds, or on the currents of water, and they may have reproduced strange varieties on soils different from their parentage; but we know of no tree in the old world which could have given a parentage to the *Wellingtonia gigantea* of Australia, there is nothing elsewhere that could have produced the mahogany tree of America, and there are many plants in Asia and Africa which are not recognized elsewhere. In the animals the distinction is more complete. There is no animal in the new world similar to the camel, there is nothing in the old like the lama. Africa alone produces the eland and a vast variety of antelopes, America the wapiti, and Australia the kangaroo.

I am aware of no event that could have destroyed those animals or vegetations in the countries where we do not find them. I will, therefore,

give nature the credit of having produced them solely where we do find them. The earth appears to be everywhere capable of production, it possesses the minerals and the metals, which are the component parts of life. Air, warmth, and moisture having found the germ in the dust of the earth, a life may be considered as the necessary result; as to the causes which produce the germ, man appears to be as ignorant as he is of the deep currents of the ocean,* or the upper currents of the atmosphere.

If we consent, then, to the formation, creation, production, or birth of life in varied places, we can place no limit to such creations. Man may have sprung from the sunny slopes of the Andes as easily as he did from the cradle of Asia, and the Bible history is no less true if he did so. The lama and kangaroo are not supposed to have entered into the ark, and the beautiful eland is

* Most interesting enquiries on this subject are noticed in the *Times* of 14th September, 1868.

not mentioned as a sacrifice. These unknown creatures, like the unknown regions of the earth, are not alluded to in holy writ, but that is no less true as far as it goes ; it is more, it is a beautiful truth, and exhibits to us a faith, a hope, a charity ; a trust of a people in their Maker, and a mercy of a Maker to His people.

I go beyond this limit of a Creator's love, and imagine that this mercy had a wider sphere, that as His spirit moved over the face of the waters and formed the dry land, so His spirit moved upon the dry land in more places than one, and while he created grass, and herb, and tree, fowls of the air, fishes of the sea, the creeping thing, beasts, and all that live upon the earth, in all regions, he was preparing habitations everywhere for man.

Man is the last step in the creation as far as it has gone, and man, almost everywhere, appears to have a knowledge of divinity, the vestiges of religion in many places are pure and holy, and

we are even now finding traces of similar religions in America, in Asia, and in England, a religion that has died out in England with the Druids. In some regions religion has branched out into as many divinities, as occasion demanded, but for us has been reserved that beautiful religion of the Trinity, the first doctrine of which is our duty towards God, and the second is our duty towards our neighbour.

The commandments to carry out these precepts were originally concise and plain; but as the ancients manufactured a God for every occasion, we manufactured a law; the plain commandments were not enough for us, one God was not enough for them. They ran into confusion, and we are fast running in the same direction. Thus we follow nature in her changes. The birth place of the first man, however, is not known, the site of the garden of Eden has not been discovered; theories and fancies have been given to us, yet no certain place is found; but beyond the place

where the Bible fixes it with a wide margin, we find records of nations of whom there are no traces in history.

There are great monuments in Ceylon, and grand vestiges in Mexico, and I find by "The Times" of September 5, 1868, that four races of men are supposed to have preceded the red man of America, the legend of whose coming is lost. Some of these old races buried their dead in a sitting posture; not long since a headless Indian was found in the forests of the Rocky Mountains in that position; there are tribes in India who still bury thus. "Sit down!" is the salutation to a living stranger in the East. Was the position selected as the most honourable for the dead?

There is another region of the world, to which curiosity has been directed since the time of Herodotus (or for over 2,300 years); this curiosity has only lately been partly gratified. We have discovered that there is water, and food, and animal

life in plenty in Central Africa, and that vast regions send their water sheds to Lake Victoria Nyanza. Man is there in an original state, with the same face as is represented in the most ancient sculptures of the East as belonging to the Gods.

I might refer to books, but my subject would never have an end, and I believe I have said enough to make people think that other human beings may have been produced from the earth before Adam, and that as the Almighty was capable of creating the lower orders of life in all regions, man has no right to limit the creation of himself to one.

The Bible tells us that man was created in the likeness of God; we find man's early ideas of a god in the sculptures of the East, yet, "No man hath seen God at any time." From whom then did the sculptor copy? The Bible tells us that the sons of God took unto them the daughters of men. Who were these sons of God?

I think there is a wider sphere than the land of Adam, over which God the Creator spread His fostering spirit, and that as He created all vegetable life on the earth, and in the sea, in all regions, so He created all animal life in every region, where the moisture and the warmth allowed it, where the herb and the fruit grew spontaneous, and afforded an easy food to the bird, the cattle, and the man.

The succession in creation, as given to us in the Bible, is grand and beautiful; nothing was created till its place was ready for it, and before the grass and herb or tree were produced we come upon an unknown time, when the hazy light divided the day from the night, the commencement of that love, which, springing from the Creator, has from that time to this increased in intensity for this earth, and for all that is upon it.

The Mosaic record of creation tells us of their

own progenitor, of their own world, and their own people, the inspiration required the writer to go no further ; but the discovery of other lands beyond what was then their whole earth, does not militate against the beautiful truths written by him. He calls God "Almighty," and we may give him the credit of being so ; the old writer intended no limit to His power, but his limit has been accepted from that time to this, he knew of nothing beyond a small region in Asia, and a smaller in Africa, he went to the utmost limits of his knowledge, and would doubtless have gone farther if he had known the boundaries of the earth.

This inspired writer has taught us to believe in a God as the Creator, a belief handed down in beauty and in purity from His time till now ; we can make this belief purer, grander, and more beautiful, we can believe that His word was from an eternity, that it was Almighty, and extended

over every region of this earth, from its darkness and its chaos, when His spirit moving upon the face of the waters created this beginning, which is now, and ever shall be, world without end. Amen.

THE END.

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